IN THE CLAIMS:

Please amend Claims 85, 90, 95-97, 99-103, 105, 106, 117-121, 123, 126, 129-134, 137, 138, 140-143, 159-161, 163, 165, 169, 172, 179, 182, 183, 186, 187, 192, 194, 245, 247, 253, 255, 258, 264, 265, 270, 273, 274, 277, 284-287, 290, 301, 302-310, 312, 313, 319, 320, 322, 326, 328, 330-333, 335, 337-339, 341-343, 349, 350, 352, 355, 357 and 358 as follows. Claims 360-396 are new. Claims 92, 111, 112, 254, 259, 288 and 289 have been cancelled.

Please amend Claim 85 as follows:

85. (Currently Amended) A method for locating a terrestrial mobile station, M, when there is an occurrence of at least one of (A) and (B) following: (A) said terrestrial mobile station M being tracked, and (B) a request for locating said terrestrial mobile station M; wherein said method uses wireless signal measurements obtained from transmissions between said terrestrial mobile station M and a plurality of terrestrial communication stations, each capable of at least one of: wirelessly detecting said terrestrial mobile station M, and wirelessly being detected by said terrestrial mobile station M, comprising:

providing access to first and second mobile station location estimators, wherein said location estimators provide likely geographical ranges of an unknown location of said mobile station M when said location estimators are supplied with corresponding input data obtained using wireless signal measurements obtained by transmissions between said mobile station M and the communication stations;

wherein said first location estimator performs one or more of the following techniques (a) through (d) when supplied with said corresponding input data:

(a) an <u>first</u> [angulation] technique for determining, for at least one of the communication stations, CS, at least one of (i) and (ii) following: (i) a distance between the communication station CS and the mobile station M, said distance dependent upon signal time delay derived information, and (ii) a wireless signal angle of arrival between the mobile station M and the communication station CS, wherein said at least one communication station CS is stationary;

(b) a learning technique, wherein said learning technique uses a learned association for associating (b1) and (b2) following:

(b1) information obtained from at least one of signal strength and signal time delay measurements of wireless signal<u>s</u> communicated between the mobile station M and the communication stations, and

(b2) data identifying a likely geographical range for a location for the mobile station M, wherein said association is learned by a training process using a plurality of data pairs, each said data pair including: first information identifying a known location of some mobile station, and second information from wireless signal measurements communicated between said some mobile station and one or more of the communication stations when said some mobile station is at the known location;

(c) a stochastic technique, wherein said stochastic technique uses a statistical correlation for correlating (c1) and (c2) following:

(c1) information obtained from at least one of signal strength and signal time delay measurements of wireless signals between the mobile station M and the communication stations, and

(c2) data, D, [identifying a likely geographical range for a location for the mobile station M] wherein for each location L_c of a plurality of locations, said data D includes one or more wireless signal measurements related to a wireless communication between some mobile station different from the mobile station M when the different mobile station is substantially at L_c, and ,

wherein said correlation is used for determining a likely geographical range, GR, for a location for the mobile station M and data indicative of a probability that the mobile station M is within the likely geographical range GR [of (c2)];

(d) a signal location [multipath resolution] technique for determining a likely geographical range or location (L) for a location of the mobile station M, wherein for determining L, (d1) - (d2[3]) following hold:

(d1) the signal location [multipath resolution] technique is dependent upon characteristics of wireless signals [multipath data, wherein the multipath data is] obtained from wireless signal [multipath] information communicated between the mobile station M and the communication stations[,];

(d2) the signal location [multipath resolution] technique is dependent upon (i) and (ii) following: (i) a representation of each of a plurality of geographical locations and (ii) for each of the geographical locations, corresponding wireless signal

characteristics of [multipath information] previously obtained using transmissions between some mobile station (M_d) different from M, and the communication stations, when the some mobile station M_d transmitted from approximately the geographical location[,

(d3) the multipath resolution technique selects one or more of the geographical location representations that are likely to be approximate to the unknown location];

wherein said signal location technique performs a step of determining L as being closer to one or more of the geographical locations of (d2)(i), when a greater similarity is determined between the corresponding wireless signal characteristics for the one or more of the geographical locations, and the characteristics of wireless signals of (d1);

wherein said determining step uses signal characteristics indicative of multipath for determining the similarity;

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first receiving, from said first location estimator, in response to said first location estimator obtaining a first instance of its said corresponding input data for said at least one occurrence, first location related information having at least a first likely geographical range for a location of the mobile station M;

second receiving, from said second location estimator, in response to said second location estimator obtaining a second instance of its said corresponding input data for said at least one occurrence, second location related information having at least a second likely geographical range for the location of the mobile station M;

wherein for locating at least one mobile station M_k of a plurality of mobile stations that also includes M, at least one of said first and second location estimators determines a geographical range for M_k using a delay time of a signal from at least one non-terrestrial wireless transmitter to M_k for determining a spatial range between M_k and the at least one non-terrestrial wireless transmitter;

wherein each of said first and second likely geographical ranges is determined in a manner that is substantially unaffected by the likely geographical range of the other of said first and second location estimators;

determining a resulting location estimate of the mobile station M that is dependent upon at least one of: (a) and (b) following: (a) a first value obtained from said first location related information, and (b) a second value obtained from said second location related information.

2 86 (Previously Added) The method as claimed in Claim 85, further including:
first supplying said first location estimator with said first instance; and
second supplying said second location estimator with said second instance;
wherein for at least one of said four steps of first and second supplying, and, first and second receiving uses a transmission on the Internet.

3 87. (Previously Added) The method as claimed in Claim 85, further including a step of receiving said wireless signal measurements during a wireless communication between said mobile station M and said plurality of communication stations for contacting an emergency response center.

4 88. (Previously Added) The method as claimed in Claim 85, wherein said step of providing access includes transmitting, through a telecommunications network, said first location estimator from a source site to an activation site for generating said first likely geographical range.

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5 89. (Previously Added) The method as claimed in Claim 88, wherein said step of transmitting includes sending an encoding of said first location estimator via the Internet.

Please amend claim 90 as follows:

6 90. (Currently Amended) The method as claimed in Claim 85, further including a step of retrieving at least one of (e) and (f) following:

(e) first historical location data including (i) and (ii) following:

(i) a first set of likely geographical ranges for one or more mobile station locations, said geographical ranges of said first set are generated by a location estimator LE_1 providing a plurality of first outputs wherein each of said first outputs includes at least one geographic value that is substantially effectively equivalent to a value of a corresponding output of said first location estimator, wherein LE_1 uses first data obtained from wireless signal measurements of transmissions between (1) and (2) following: (1) one or more of a plurality of mobile stations, at a first plurality of locations, and (2) said plurality of communication stations;

wherein said first set is selected by determining that a [distance related] value related to a distance between at least one of said likely geographical ranges of said

first set, and said first likely geographical range for the location of the mobile station M [has] satisfies a predetermined [relationship] condition; and

(ii) data identifying said locations of said first plurality of locations; and

(f) second historical location data including (iii) and (iv) following:

(iii) a second set of likely geographical ranges for one or more mobile station locations, said geographical ranges of said second set are generated by a location estimator LE_2 providing a plurality of second outputs wherein each of said second outputs includes at least one geographical value that is substantially effectively equivalent to a value of a corresponding output of said second location estimator, wherein LE_2 uses second data obtained from wireless signal measurements of transmissions between (3) and (4) following: (3) one or more mobile stations, at a second plurality of locations, and (4) said plurality of communication stations;

wherein said second set is selected by determining that a [distance related] value, related to a distance between (5) and (6) following:

(5) at least one of said [previous] likely geographical ranges for one or more mobile station locations of said second [set] plurality of locations, and

(6) said second likely geographical range for the location of the mobile station M_x

is less than a second predetermined value, and

(iv) data identifying said locations of said second plurality of locations.

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7 ~~91~~. (Previously Added) The method as claimed in Claim ~~85~~ 1, further including, for at least one likely geographical range of said first and second likely geographical ranges, a step of obtaining a likelihood value that the at least one likely geographical range of said mobile station M includes said mobile station M, wherein said likelihood value is obtained using previous likely geographical ranges for one or more mobile station locations generated by a location estimator LE providing a plurality of outputs wherein each of said outputs includes at least one geographical value that is substantially effectively equivalent to a value of a corresponding output of the location estimator that generated said at least one likely geographical range.

Please cancel Claim 92.

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94. (Previously Added) The method as claimed in Claim 85, further including performing a first simulation for predicting a likelihood of said mobile station M being in said first likely geographical range, wherein said simulation uses pairs of location representations, wherein for each pair, a first member of the pair includes a likely geographical range obtained from a location estimator LE providing an output wherein said output includes at least one geographical value that is substantially effectively equivalent to a value of a corresponding output of said first location estimator for locating a different mobile station, and a second member of the pair including a representation of an independently determined location of the different mobile station.

Please amend claim 95 as follows:

95. (Currently Amended) The method as claimed in Claim 85, wherein at least one of said first and second location estimators utilize one of the following:

(a) a pattern recognition location technique for estimating a location of said mobile station M by recognizing a pattern of characteristics of said corresponding input data obtained from at least first and second transmission paths of multiple transmission paths of the transmissions between said mobile station M and at least one of the communication stations;

(b) a mobile base station estimator for estimating a location of said mobile station M from location information received from a mobile base station detecting wireless transmissions of said mobile station M; and

(c) a coverage area location technique for estimating a location of said mobile station M by determining an [common] area of wireless coverage area[s] for [different sets of] one [or more] of said communication stations.

Please amend Claim 96 as follows:

96. (Currently Amended) The method as claimed in Claim 85, wherein at least one of the following (a) through (c) holds:

(a) for said learning technique, said association is provided, at least in part, by an artificial neural network for recognizing a pattern of characteristics of location information obtained from said wireless signal measurements;

(b) said first [angulation] technique provides the distances between the mobile station M and said at least one communication station using one or more of: a wireless signal time of arrival, a wireless signal time difference of arrival, and a wireless signal strength indication; and

(c) said stochastic technique provides said statistical correlation using one of: principle decomposition, least squares, and partial least squares[, and Bollenger Bands].

Please amend Claim 97 as follows:

97. (Currently Amended) A method for estimating, for each mobile station M of a plurality of mobile stations, an unknown terrestrial location, L, for M using wireless signal measurements obtained from transmissions between said mobile station M and a plurality of fixed location terrestrial communication stations, wherein each of said communications stations is substantially co-located with one or more of a transmitter and a receiver for wirelessly communicating with said mobile station M, comprising:

initiating one or more requests for information related to the location of said mobile station M with one or more mobile station location evaluators such that when said location evaluators are supplied with corresponding input data having values obtained using wireless signal measurements obtained via transmissions between said mobile station M substantially at L, and the communication stations, said one or more location evaluators perform at least two of the following techniques (i), (ii) and (iii):

(i) a first technique for estimating where said mobile station M is located using signal time delay values obtained from signals received at the mobile station M from one or more satellites, wherein said first technique uses said signal time delay values for determining one or more distances between said mobile station M and said one or more satellites;

(ii) a second technique for recognizing multipath characteristics, wherein said second technique includes the steps of (a) and (b) following:

(a) calibrating, for each location L_a of a plurality of geographical locations, (a1) and (a2) following: (a1) a representation of the geographical location L_a, and (a2) for the geographical location L_a, corresponding multipath information indicative of

multipath signals previously transmitted between some mobile station (M_2) and the communication stations, when the some mobile station M_2 transmitted from approximately the geographical location L_a;

(b) determining one or more likely location estimates for M by identifying a similarity between (b1) and (b2) following: (b1) multipath characteristics determined from wireless signals communicated between the mobile station M and the communication stations, and (b2) the multipath information of (a2) for a collection of one or more of the geographical locations; and

(iii) a third technique, wherein said third technique uses a statistical correlation for correlating (c) and (d) following:

(c) values that are a function of at least one of: a signal strength and a signal time delay of wireless signals between said mobile station M and the communication stations, and

(d) information indicative of: a plurality of collections of wireless signal measurements, wherein for each said collection, there is a known location S where said collection is obtained from transmissions between said communication stations and some mobile station (M_3) at the location S;

wherein said correlation is used for determining that the mobile station M is within a corresponding geographic area;

obtaining a first collection of one or more location estimates of said mobile station M, from said one or more location evaluators using said corresponding input data;

wherein for locating at least one mobile station M_k of a plurality of mobile stations that also includes M, at least one of said first and second location estimators determines a geographical range for M_k using a delay time of a signal from at least one of the satellites to M_k for determining a spatial range between said mobile station M_k and the at least one satellite;

wherein said step of obtaining requires two way communication between the mobile station M and at least one of the communication stations prior to performing any of said first, second and third techniques;

transmitting, to a predetermined destination via a communications network, resulting information related to the location L of said mobile station M, wherein said resulting information is dependent on at least said first collection of location estimates.

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12 98 (Previously Added) The method of Claim 97, further including the following steps:

second obtaining, from a second set of said one or more location evaluators, a second collection of one or more location estimates using values obtained from wireless signal measurements for a time different from a time of the transmissions between the mobile station M and the communication stations for supplying said corresponding input data;

determining, as part of said resulting information, a resulting location estimate of the mobile station M, wherein said resulting location estimate is dependent upon: (a) a first value obtained from said first collection of location estimates, and (b) a second value obtained from said second collection of location estimates.

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Please amend Claim 99 as follows:

13 99. (Currently Amended) A method for locating mobile stations at one or more unknown terrestrial locations using wireless signal measurements obtained from transmissions between said mobile stations and a plurality of fixed location terrestrial communication stations, wherein each of said communications stations includes one or more of a transmitter and a receiver for wirelessly communicating with said mobile stations, comprising:

receiving, from a plurality of location requesting sources, a plurality of input requests for locations of the mobile stations, wherein for each of the input requests there is a corresponding destination for a responsive output;

for each of the input requests, providing one or more location requests for location information, related to a location of one of said mobile stations, to one or more mobile station location determining sources such that said one or more location determining sources perform at least two of the following techniques (i), (ii), (iii) and (iv):

(i) a first technique for determining location information of said mobile stations, wherein for at least some geographical location of some mobile station M1 of the mobile stations, the first technique outputs first data providing geographical information for locating M1 using a signal time delay value dependent upon a first input obtained from a signal, S_1, received at the mobile station M1 from a satellite, wherein said first technique uses said signal time delay value for determining at least one distance between said mobile station M1 and the satellite;

(ii) a second technique for determining location information for said mobile stations, wherein for some mobile station M2 of the mobile stations, the second technique outputs second

data providing geographical information for locating M2 by recognizing a pattern of characteristics of a second input obtained from wireless communications between M2 and the communication stations, wherein said second technique uses an association for associating, for each location L of a plurality of mobile station locations, multipath wireless signal characteristics between: (a) one or more of the communication stations, and (b) one of the mobile stations at the location L;

(iii) a third technique for determining location information for said mobile stations, wherein for at least some geographical location of some mobile station M3 of the mobile stations, and for at least a corresponding one of the communication stations CS that is responsive to transmissions from the mobile station M3, the third technique in response to a third input, outputs third data providing geographical information for locating M3 using one of (a) and (b) following:

(a) a distance between the communication station CS and the mobile station M3, said distance dependent upon measurements of a time delay of signals transmitted between the mobile station M3 and the communication station CS, said measurements of a time delay obtained from the third input, and

(b) a direction of M3 from CS, wherein the third input is indicative of an angular orientation about the communication station CS of a direction of the wireless transmissions to CS from M3; and

(iv) a fourth technique for determining information for likely locations of the mobile stations, wherein for each mobile station M4 of at least some of the mobile stations, the fourth technique outputs fourth data providing geographical information for locating M4, wherein (c) - (e) following hold:

(c) the fourth technique is dependent upon multipath data of a fourth input, wherein the multipath data is obtained from wireless signal multipath information communicated between the mobile station M4 and the communication stations,

(d) the fourth technique is dependent upon (d1) and (d2) following: (d1) a representation of each of a plurality of geographical locations, and (d2) for each location, L_d, of the geographical locations, corresponding multipath information previously obtained using transmissions between some one of the mobile stations and the communication stations, when the some one mobile station transmitted from approximately the geographical location L_d,

(e) the fourth technique determines one or more of the geographical location representations that are likely to be approximate to at least one unknown location of the mobile station M4;

first obtaining, in response to a first of the location requests received from a first of the requesting sources, at least a first location information of a first location of a first of said mobile stations, said first location information is determined using [a first set of one or more of] at least said first data from an instance of said first technique[said first, second, third, and fourth data], wherein for each of the techniques (i), (ii), (iii) and (iv) above used to obtain said first location information[each member of said first set], the first mobile station is a respective occurrence of the corresponding one of the mobile stations M1, M2, M3, and M4[, and wherein said first location information is dependent upon each of the instances of said first, second, third, and fourth inputs corresponding to a member of said first set];

first determining, using said first location information, first output location data according to a first output criteria for the corresponding destination for the first request, said first output location data including a representation identifying a first geographical range of the first location;

second obtaining, in response to a second of the location requests received from a second of the requesting sources, at least a second location information of a second location of a second of said mobile stations, said second location information is determined using a [second]set of one or more instances of said first, second, third, and fourth data, wherein for each of the techniques (i), (ii), (iii) and (iv) above used to obtain said second location information, [each member of said second set,]the second mobile station is a respective occurrence of the corresponding one of the mobile stations M1, M2, M3, and M4, and wherein said second location information is dependent upon each of the instances of said first, second, third, and fourth inputs corresponding to a member of said [second] set;

second determining, using said second location information, second output location data according to a second output criteria for the corresponding destination for the second request, said second output location data including a representation identifying a second geographical range of the second location;

wherein there is at least one technique of said first, second, third, and fourth techniques, such that said first location information [geographical range] is dependent upon first geographical information from an instance of said at least one technique['s corresponding member in said first set], and wherein said second location information is dependent upon at least one geographical extent for identifying the second location, wherein the at least one geographical extent [geographical range] is not dependent upon

any geographical extent for identifying the second location [information for locating the second mobile station from] determined by any instance of said at least one technique;

wherein for at least one of said first and second output criteria there is an output criteria for another of the location requests that is different from said at least one output criteria;

first transmitting said first output location data to its corresponding destination via a communications network; and

second transmitting said second output location data to its corresponding destination via a communications network.

14 Please amend claim 100 as follows:

14 ~~100~~. (Currently Amended) A location system for determining a location of a mobile station M, wherein said mobile station is one of a plurality of mobile stations, and signal measurements are available of wireless transmissions between the plurality of mobile stations and a plurality of terrestrial communication stations, comprising:

one or more location estimators, each said location estimator for estimating a likely geographical location for each of one or more individual mobile stations of the plurality of mobile stations when said location estimator is supplied with data obtained from a set of said wireless signal measurements provided by wireless transmissions between the individual mobile station and at least one of said plurality of communication stations;

an archive for storing a plurality of data item collections, wherein for each geographical location of a plurality of geographical locations, there is one of said data item collections having (a1) and (a2) following:

(a1) a representation of the geographical location, and

(a2) data obtained from wireless signal measurements provided by one of the plurality of mobile stations transmitting from approximately the geographical location of (a1);

a performance evaluator for determining, for at least one of said location estimators, ESTR, a corresponding one or more performance measurements indicative of a previous performance of said one location estimator ESTR in locating one or more of the plurality of mobile stations, wherein said corresponding performance measurements are determined using said data item collections;

a controller for activating a group of at least one of said location estimators, having ESTR therein, wherein (b1) and (b2) following occur:

(b1) ESTR outputs a corresponding likely geographical location **LE** of an unknown location of said mobile station M when ESTR is activated with a first said set of wireless signal measurements provided by wireless transmissions between said mobile station M and at least one of said plurality of communication stations for determining the unknown location of M in substantially real time with receiving said transmissions, and

(b2) the likely geographical location LE has a corresponding likelihood value indicating a likelihood of said mobile station M being at a location represented by LE, wherein said one or more corresponding performance measurements for said one location estimator ESTR are used in determining said corresponding likelihood value;

a location determiner for determining resulting location information for said mobile station M, wherein said location determiner uses LE to obtain the resulting location information, and wherein said resulting location information is dependent upon said corresponding likelihood value.

Please amend claim 101 as follows:

101. (Currently Amended) A method for determining a location of a mobile station, M, wherein said mobile station M is one of a plurality of mobile stations, and signal measurements are capable of being obtained by wireless transmissions between the plurality mobile stations and a plurality of fixed location communication stations, each of said communication stations capable of at least one of: wirelessly detecting said mobile station M, and wirelessly being detected by said mobile station M, comprising:

providing access to a first [instance]of a mobile station location estimator for estimating, for each of one or more of said mobile stations, a location of the mobile station when said first [instance]location estimator is supplied with corresponding input data obtained using said signal measurements obtained by wireless transmissions between the mobile station and said plurality of communication stations;

storing a plurality of data collections, wherein for each of a plurality of geographical locations, there is one of said data collections having (a1) and (a2) following:

(a1) a representation of the geographical location, and

(a2) a representation of one or more of (i) and (ii) following: (i) data (D) indicative of said signal measurements between one of the mobile stations and the plurality of communication stations when said one mobile station is approximately at the geographical location of (a1), and (ii) a location estimate output by a location estimator

(LE) when LE is supplied with said corresponding input data for said first location estimator for one of said mobile stations being approximately at the geographical location of (a1), wherein LE is one of: said first mobile station location estimator, or another location estimator providing location estimates that are effectively identical to those of said first location estimator;

obtaining, from said signal measurements between said mobile station M and said plurality of communication stations, an initial location estimate of said mobile station M from said first [instance]mobile station location estimator, wherein said location of M is unknown;

[additionally] obtaining additional data for locating the mobile station M, wherein said additional [location] data includes information related to at least one of: an inaccuracy in said initial location estimate, and an increased accuracy in locating the mobile station M, wherein said additional data is obtained as a function of one or more additional location estimates, wherein said additional estimates satisfy a condition indicative of a closeness of said additional estimates to said initial estimate, and wherein said additional location estimates are provided [output] by one of (b1) and (b2) following:

(b1) said first mobile station location estimator, or some [a second instance of said]location estimator providing location estimates that are effectively identical to those of said first location estimator, when [said second instance is] supplied with said corresponding input data (ID) for said first location estimator for locating one of said mobile stations, wherein said corresponding input data ID is obtained from data D [input from at least one of said representations of signal measurements] of (a2)(i) for one of the data collections [for at least one of said data collections, wherein for each occurrence of at least a majority of occurrences of locating the mobile stations, said first and second instances output location estimates that are approximately the same]; and

(b2) the portions (a2)(ii) for one or more of the data collections;

deriving a further location estimate of said mobile station M, wherein said deriving step uses said additional data to determine said further location estimate as a more accurate location estimate of the mobile station M than said initial location estimate, and wherein said further location estimate is dependent upon a group of one or more of said geographical location representations of (a1) for said data collections whose representations of (a2) were used in obtaining one of said additional location estimates [using a group of one or more of said geographical location representations of (a1) for said data

collections whose representations of signal measurements of (a2) were used to generate one of said additional location estimates].

Please amend Claim 102 as follows:

102. (Currently Amended) The method as claimed in Claim 101, wherein said step of deriving includes determining information indicative of a geographical area[an area boundary] of said further location estimate as a function of said geographical location representations in said group.

Please amend claim 103 as follows:

Please amend Claim 103 as follows:

103. (Currently Amended) A location system for locating a mobile station M using wireless signal measurements obtained from transmissions between said mobile station M and a network of transceivers, wherein said transceivers are cooperatively linked for use in locating the mobile stations, comprising:

a communications interface for routing, to each of one or more location estimators, corresponding input data for estimating one or more initial locations of said mobile station M, wherein said corresponding input data is obtained using measurements of wireless signals obtained by transmissions between (i) and (ii) following:

(i) the mobile station M, at a corresponding geographical location, and

(ii) the network of transceivers;

a location estimate adjuster for deriving an additional location estimate of said mobile station M using a first initial location estimate generated by a first of said location estimators, wherein said additional location estimate is determined using one or more other location estimates generated by a second [one of said] location estimator[s], wherein a range is accessed such that said other location estimates are within said [a predetermined] range of [area about] said first initial location estimate, and said additional location estimate is determined using known locations corresponding to said other location estimates; and

an output gateway for transmitting, to a predetermined destination, a resulting location estimate that is dependent upon one or more of said first initial location estimate and said additional location estimate.

Please amend Claim 105 as follows:

105. (Currently Amended) The location system, as claimed in Claim 103, further including a most likely estimator for determining said resulting location estimate of the corresponding geographical location of the mobile station M, said resulting location estimate being derived using said additional location estimate and a [its] corresponding confidence value therefor, said most likely estimator includes a probability density function for fuzzifying at least said confidence value for said additional location estimate over an area adjacent a boundary of said additional location estimate.

Please amend Claim 106 as follows:

106. (Currently Amended) A location system for locating mobile stations using wireless signal data obtained from transmissions between said mobile stations and a network of fixed location communication stations, wherein said communication stations are cooperatively linked for use in locating said mobile stations, comprising:

an archive for storing a plurality of data collections, wherein for each of a plurality geographical locations, there is one of said data collections having (a1) and (a2) following:

(a1) a representation of the geographical location,

(a2) a set of said wireless signal data obtained using transmissions between one of said mobile stations and the network, wherein the one mobile station transmits from approximately the geographical location of (a1);

an interface for communicating with a plurality of location estimators, one or more of which are included in the category (b1) following, and one or more of said location estimators are included in the category (b2) following:

(b1) a first category of adaptable location estimators, wherein each said adaptable location estimator generates geographical location estimates for each mobile station (M_{b1}) of a plurality of said mobile stations[,] when [wherein for each] said adaptable location estimator receives corresponding input[, there is a corresponding group of wireless signal measurement parameters, wherein for said adaptable location estimator to generate a location estimate of an individual one of said mobile stations, at least some of said parameters must be instantiated with] values obtained from transmissions between said [individual] mobile station M_{b1} and a plurality [one or more] of the communication

stations, and wherein each said adaptable location estimator adapts its generated geographical location estimates according to changes in said data collections of said archive;

(b2) said second category of location estimators, wherein each said location estimator of said second category determines a location for each mobile station (M_{b2}) of a plurality of said mobile stations by using wireless signals, S, received by M_{b2}, or another of said mobile stations, from a plurality of non-terrestrial transmitting stations, wherein said wireless signals S provide time values for determining a spatial range between: (i) M_{b2} or the another mobile station, and (ii) each of at least two of the non-terrestrial stations, wherein the spatial ranges are determined from transmission times for each of the wireless signals transmitted by the at least two of the non-terrestrial transmitting stations;

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a location estimator selector for selecting one or more of said plurality of location estimators for generating mobile station location estimates;

wherein for locating one of said mobile stations, M, said location estimator selector selects one or more of: one of said adaptable location estimators, and one of said location estimators of said second category according to whether said corresponding input values are available [at least some of said parameters from said corresponding group of parameters for the adaptable location estimator are able to be instantiated using wireless signal measurements obtained from transmissions between said mobile station M and the communication stations].

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107. (Previously Amended) The location system of Claim 106, further including a combiner location estimator for determining a resulting location estimate of said mobile station M by combining a plurality of location estimates from the selected one or more location estimators.

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110. (Previously Added) The location system as claimed in Claim 107, wherein at least a first of said adaptable location estimators includes a first artificial neural network, and said first artificial neural network is one of: a multilayer perceptron, an adaptive resonance theory model, and radial basis function network.

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Please cancel Claim 111.

Please cancel Claim 112.

22

113. (Previously Added) A location system for locating a wireless mobile station that is capable of communicating with a plurality of networked communication stations, comprising:

a transceiver: (a) for at least detecting a direction of wireless signals transmitted from the mobile station, and (b) for communicating with said networked communication stations information related to a location of said wireless mobile station;

a signal analyzer for determining whether a detected wireless signal from said mobile station has been one of: reflected and deflected;

one or more location estimators for providing one or more location estimates of said mobile station by using wireless signals transmitted from said mobile station, wherein at least one of said location estimators utilizes the signals from said mobile station that are determined to be neither reflected nor deflected; and

a transport for moving at least said transceiver when locating said wireless mobile station.

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114. (Previously Added) The location system as claimed in Claim 22 113, wherein said signal analyzer includes a comparator for comparing: (a) a distance of said mobile station from said transceiver using a signal strength of said wireless signals from said mobile station, with (b) a distance of said mobile station from said transceiver using a signal time delay measurement of wireless signal from said mobile station.

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115. (Previously Added) The location system as claimed in Claim 22 113, further including one or more transceiver location estimators for estimating a location of said transceiver, wherein at least one of said transceiver location estimators uses data from wireless signals communicated between: (i) said transport, and (ii) one of: said networked communication stations and a global positioning satellite.

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116. (Previously Added) The location system as claimed in Claim 24 115, further including a deadreckoning component operatively movable with movements of said transport for estimating a change in a location of said transceiver, wherein said deadreckoning component determines incremental updates to at least one location estimate of said transport output by at least one of said transceiver location estimators.

Please amend claim 117 as follows:

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117. (Currently Amended) A method for locating a first and second wireless mobile stations using measurements of wireless signals, wherein at least one of: (i) said measurements, and (ii) said wireless signals are transmitted: (1) between the first mobile station and at least one of a plurality of terrestrial transceivers, and (2) between the second mobile station and at least one of a plurality of terrestrial transceivers, and wherein said transceivers are capable of at least wirelessly detecting a plurality of wireless transmitting mobile stations, including said first and second mobile stations, comprising:

providing access to first and second mobile station location techniques, wherein each of said location techniques is capable of providing a location estimate for each mobile station of at least some of said mobile stations when said location technique is supplied with corresponding data obtained from wireless signal measurements communicated between the mobile station and one or more of said plurality of transceivers;

wherein (a) and (b) following:

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(a) said first location technique determines first location information for one of the mobile stations, M_a, using values that are indicative of a signal time delay between the mobile station M_a and one or more of the terrestrial transceivers, said first location technique determines the first location information by performing a triangulation or trilateration, at a location different from that of the mobile station M_a, and

(b) said second location technique determines one or more locations for one of the mobile stations M_b by performing a signal processing technique for determining location information (I_b) of the mobile station M_b using wireless signals, S, received by M_b, or another [at least one] of the mobile stations (M_c), from a plurality of non-terrestrial transmitting stations, wherein said location information is dependent upon time values obtained from said wireless signals S [provide time values, and said signal processing technique] for determining a spatial range between: (i) M_b or the another mobile station M_c, and (ii) each of at least two of the non-terrestrial transmitting stations, wherein the spatial ranges are determined from[determines at least one] corresponding transmission times [differential between the time values] for each of the wireless signals transmitted by the at least two of the non-terrestrial transmitting stations and received by the mobile station M_b or M_c;

first supplying said first location technique with corresponding first [corresponding] data obtained from wireless signal measurements communicated between one or more of (c1) and (c2) following: (c1)

said first mobile station and one or more of said plurality of transceivers, and (c2) said second mobile station and one or more of said plurality of transceivers;

second supplying said second location technique with corresponding second [corresponding] data obtained from wireless signal measurements communicated between one or more of (d1) and (d2) following: (d1) said first mobile station and one or more of said plurality of transceivers, and (d2) said second mobile station and one or more of said plurality of transceivers;

first receiving from said first location technique, first location related information representing one or more of (e1) and (e2) following: (e1) a first range of locations for the first mobile station wherein said first mobile station is an instance of M_a, and (e2) a second range of locations for the second mobile station wherein said second mobile station is an instance of M_a;

second receiving from said second location technique, second location related information representing one or more of (f1) and (f2) following: (f1) a third range of locations for the first mobile station wherein said first mobile station is an instance of M_b, and (f2) a fourth range of locations for the second mobile station wherein said second mobile station is an instance of M_b;

wherein said second location technique uses said corresponding second data to provide an improvement to said second location related information over an instance of the location information I_b;

determining resulting location information for each of the first and second mobile stations using at least one of (g1) and (g2) following: ([a]g1) a first value obtained from said first location related information, and ([b]g2) a second value obtained from said second location related information;

wherein there is at least one predetermined common location related component activated for locating each of said first and second mobile stations, wherein (h1) and (h2) following hold:

([i]h1) said common component is activated, for said first mobile station, after at least one step (S1) of said steps of first and second supplying, when [for said at least one step,] said corresponding one of first and second data, for said step S1, includes wireless signal measurements for said first mobile station, and

([ii]h2) said common component is activated, for said second mobile station, after at least one step (S2) of said steps of first and second supplying, when [for said at least one step,] said corresponding one of first and second data, for said step S2, includes wireless signal measurements for said second mobile station[;

providing said resulting location information for each of the first and second mobile stations for presentation, wherein said presentation for at least one of said first and second mobile stations is determined according to an expected accuracy of said resulting location information].

Please amend claim 118 as follows:

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~~118~~. (Currently Amended) A method for locating a wireless mobile station, comprising:

repeatedly performing the following steps (A1) through (A3) for tracking the mobile station, wherein there is at least a first and a second mobile station location technique, each of the location techniques able to provide [a] corresponding location information of a location of the mobile station at some time during said step of repeatedly performing;

(A1) receiving [a] the corresponding location information of the mobile station from at least one of the first and a second mobile station location techniques, wherein:

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(a) said first location technique determines a first location information of the mobile station when supplied with first data, wherein said first data includes timing values obtained from wireless timing signals received by the mobile station from one or more satellites, wherein the first location technique determines the first location information using information indicative of a distance [range] between the mobile station and at least one of the one or more satellites; and

(b) said second location technique determines a second location information of the mobile station when supplied with second data, wherein said second location technique uses values from said second data that are obtained using time delays of wireless signals transmitted between the mobile station and a plurality of terrestrial transceivers cooperatively linked together for use in two way communication with the mobile station, wherein the second location technique determines the second location information by determining at least one of (i) and (ii) following: (i) a representation of a locus of locations having substantially a same time difference of arrival for wireless signals communicated between: the mobile station, and each of at least two of the transceivers, and (ii) an area identified by [having substantially common] determining a correspondence between surveyed wireless signaling characteristics of the area and [multipath characteristics, wherein the area is

identified by multipath characteristics obtained from] wireless signals communicated between the mobile station and the transceivers;

(A2) determining at least one resulting location information of said mobile station using at least one of: (a) a first value obtained from an instance of the first location information received from said first location technique, and (b) a second value obtained from an instance of the second location information received from said second location technique;

wherein said step of determining includes a step of determining a likely roadway upon which the mobile station is located;

(A3) outputting said resulting location information for display on a display device, wherein said resulting location information is displayed as at least one location of the mobile station on a map having roadways thereon;

wherein: (1) an estimate of a first location of the mobile station is included in an instance of said first location information obtained from an instance of the first data for substantially the first location, and (2) an estimate of a second location of the mobile station is included in an instance of said second location information obtained from an instance of the second data for substantially the second location.

Please amend claim 119 as follows:

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119. (Currently Amended) A method for locating[, from] a plurality of wireless mobile stations, wherein for each [one] of the wireless mobile stations, M, [using] measurements of wireless signals are used[, wherein] such that at least one of:

(i) said measurements, and

(ii) said wireless signals,

is [are] transmitted between said [one] mobile station M and at least one of a plurality of fixed location communication stations, each communication station capable of at least one of receiving wireless signals from, and transmitting wireless signals to said [one] mobile station M, comprising:

receiving, from each of at least first and second mobile station location estimators, corresponding first and second information related to [a likely] geographical approximations for a location of a first instance M_1 of M [said one mobile station], wherein:

(a) for determining a likely geographical approximation, GA_A, for a location, L_A, of a second of the mobile stations (M_2) at a time T_A, said first location estimator generates

GA_A without requiring a prior likely geographical location approximation generated by said second location estimator for locating $\underline{M_2}$ [the second mobile station] at substantially the location L_A at substantially the time T_A, and,

(b) for estimating a likely geographical approximation, GA_B, for a location, L_B, of a third one of the mobile stations ($\underline{M_3}$) at a time T_B, said second location estimator generates GA_B without requiring a prior likely geographical location approximation generated by said first location estimator for locating $\underline{M_3}$ [the third mobile station] at the location L_B at substantially the time T_B;

wherein each of said first and second mobile station location estimators activates or receives an output from at least one of the techniques (A1) through [and] (A5[2]) following [hold]:

(A1) [said first location estimator performs] one or more coverage area analysis techniques for locating an instance $\underline{I_1}$ of one of the plurality of mobile stations when [said first location estimator is] supplied with first data obtained from wireless signal measurements communicated between $\underline{I_1}$ [said one mobile station] and one or more of said plurality of the communication stations, wherein each said coverage area analysis technique obtains, when activated [determines] for $\underline{I_1}$ [said one mobile station], at least one location estimate of $\underline{I_1}$ that is indicative of a wireless coverage area of one of said communication stations [at least one of (i) and (ii) following:

(i) an area determined using at least one of (a) and (b) following: (a) for each communication station CS_a of one or more of said communication stations that wirelessly detect said one mobile station, a corresponding area wherein the communication station CS_a is likely to be able to detect said one mobile station, and (b) for each communication station CS_b of one or more of said communication stations that is wirelessly detected by said one mobile station, a corresponding area wherein the communication station CS_b is likely to be detected by said one mobile station, and

(ii) an area determined using at least one of (c) and (d) following: (c) for each communication station CS_c of one or more of said communication stations that can not detect said one mobile station, a corresponding area wherein the communication station CS_c is unlikely to be able to detect said one mobile station, and (d) for each communication station CS_d of one or more of said communication stations that can not

be detected by said one mobile station, a corresponding area wherein the communication station CS_d is unlikely to be detected by said one mobile station, and];

(A2) [said second location estimator, when supplied with second data obtained from wireless signal measurements communicated between said one mobile station and one or more of said plurality of communication stations, performs at least one of the location techniques (iii) through (vii) following:

(iii)]a second [pattern recognition] technique, wherein said second [pattern recognition] technique estimates a location of an instance I_2 of one of the plurality of mobile stations, wherein when supplied with second data obtained from wireless signal measurements communicated between I_2 and one or more of said plurality of communication stations, said second technique [said one mobile station by] determines a correspondence between [using a comparison of] (1) and (2) following: (1) at least one value derived from said second data, and (2) wireless survey data (D) wherein D is obtained using [one or more] values, wherein for each value [V of the one or more values, V] is derived from mobile station wireless signal measurements at a known geographical location;

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[(iv) a trainable mobile station location estimating technique for estimating a location of said one mobile station, wherein said trainable mobile station location estimating technique is capable of being trained to associate (3) and (4) following: (3) each location L of a plurality of geographical locations, and (4) corresponding measurements of wireless signals transmitted between some one of the mobile stations and the communication stations, wherein said some mobile station is approximately at the location L;]

(A3)[(v)] a locus computing technique for estimating a location of an instance I_3 of one of the plurality of mobile stations when supplied with third data obtained from wireless signal measurements communicated between I_3 and two or more of said plurality of communication stations [said one mobile station], wherein said locus computing technique utilizes measurements (S) [M] of wireless signals from said third [second] data [between: said one mobile station, and each of two or more of the communication stations] for determining at least one locus of locations for I_3 [said one mobile station],

wherein at least one of said measurements S [M] is obtained using [a function of] a signal time delay between I_3 [said one mobile station] and at least one of the two or more communication stations;

(A4)[(vi)] a direction [an angle] of arrival technique for estimating a location of an instance I_4 of one of the plurality of mobile stations when supplied with fourth data obtained from wireless signal measurements communicated between I_4 and one of said communication stations (CS_4) [said one mobile station], wherein said direction [angle] of arrival technique determines a location estimate of I_4 [said one mobile station] using a direction from which wireless signals arrive at CS_4 [at least one of the communication stations] from I_4 [said one mobile station] wherein said fourth data is indicative of a signal direction having a resolution substantially less than 60 degrees;

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(A5)[(vii)] a signal processing technique for estimating a location of an instance I_5 of one of the plurality of mobile stations when supplied with fifth data obtained from [said one mobile station using] wireless signals received by I_5 [said one mobile station] from one or more non-terrestrial transmitting stations, wherein said wireless signals provide time values, and said signal processing technique determines at least one differential between a time of transmission and a time of arrival [the time values] for the wireless signals transmitted by a plurality [two] of the non-terrestrial transmitting stations;

wherein for at least some instance M_k of M, at least said first location estimator activates or receives an output from an instance of said technique of (A5) for locating M_k;

determining a resulting location estimate of said [one] mobile station M_1, wherein said step of determining includes at least one of the substeps (B1) through (B3) following:

(B1) when said first and second information include, respectively, first and second likely geographical approximations, combining said first and second likely geographical approximations so that said resulting location estimate is dependent on each of said first and second location likely geographical approximations;

(B2) obtaining one or more rating values for rating said first and second information, wherein said rating values are indicative of relative expected performances of said first and second location estimators in locating said one mobile station; and

(B3) selecting one of said first and second information for receiving preference in determining said resulting location.

Please amend claim 120 as follows:

120. (Currently Amended) The method of Claim 119, wherein said [one] mobile station M_1 is part of a mobile base station.

Please amend claim 121 as follows:

121. (Currently Amended) A method for locating a terrestrial wireless mobile station capable of wireless two way communication with a plurality of fixed location terrestrial stations, comprising:

[providing access to a plurality of mobile station location estimating techniques, wherein said location techniques provide location information related to said mobile station when said location techniques are supplied with corresponding input information upon which their location estimates are dependent, and wherein the corresponding input information is at least partially derived from measurements of wireless signals transmitted from or received at the mobile station;]

receiving, over time, a plurality of location estimates of the mobile station from a plurality of mobile station location estimating techniques, wherein said location techniques generate location information related to said mobile station when said location techniques are supplied with corresponding input information upon which their location information is dependent, and wherein the corresponding input information is at least partially derived from measurements of wireless signals transmitted from or received at the mobile station[,];

wherein said step of receiving includes steps (a) and (b) following:

(a) first receiving, from a first of said location techniques, first location information for the mobile station, wherein said corresponding input information for said first location technique includes timing data from wireless signals transmitted from one or more global positioning satellites, and received by the mobile station, wherein said first location technique also uses information dependent upon a location of a terrestrial transceiver, TS, that receives wireless transmissions from the mobile station, and resulting in the first location information being dependent on the location of TS and the timing data, wherein TS is remote from the mobile station;

(b) second receiving, from a second of said location techniques, second location information for the mobile station, wherein said corresponding input information for said second location technique includes data that is a function of a signal time delay of wireless signals transmitted between the wireless mobile station and one of said plurality of fixed location terrestrial stations during a plurality of transmissions between the mobile station and the one terrestrial station wherein there is at least one transmission from the mobile station to the one terrestrial station, and at least one transmission from the one terrestrial station to the mobiles station, and wherein said second location information is determined by said second location technique at a terrestrial site whose location is independent of a movement of the mobile station;

determining, a plurality of consecutive resulting location estimates for tracking the mobile station, wherein said step of determining includes steps (c) and (d) following:

(c) obtaining [deriving], for at least one time during the tracking, a corresponding one of said resulting location estimates of the mobile station using an instance [one] of said first information received from [one or more location estimates by] said first location technique for a first location of the mobile station; and

(d) obtaining [deriving], for at least one time during the tracking, a corresponding one of said resulting location estimates of the mobile station using an instance [one] of said second information received from [one or more location estimates by] said second location technique for a second location of the mobile station.

122. (Previously Added) The method as claimed in Claim 121, wherein said step of determining includes:

establishing a priority between a location estimate of said first location information and a location estimate of said second location information.

Please amend claim 123 as follows:

123. (Currently Amended) The method as claimed in Claim 122, wherein said step of establishing a priority includes obtaining a confidence value for one or more of: (a) at least one of said location estimates for said first location information; and (b) at least one of said location estimates for said second location information;

wherein each said confidence value is indicative of a likelihood of the mobile station having a location represented by said corresponding location estimate for the confidence value.

Please amend claim 124 as follows:

124. (Previously Added) The method as claimed in Claim ~~121~~, wherein said step of determining includes preferring a location estimate of said first location information over a location estimate of said second location information when both are available for substantially a same location of the mobile station.

125. (Previously Added) The method as claimed in Claim ~~121~~, wherein said step of determining includes, for at least one of said resulting location estimates, determining one or more of: (a) a velocity of the mobile station, (b) an acceleration of the mobile station, and (c) one or more geographical features near said at least one resulting location estimate.

Please amend claim 126 as follows:

126. (Currently Amended) A method for providing a location estimate of a wireless mobile station using measurements of wireless signals, comprising:

first providing[transmitting], when available, a first collection of measurements of wireless signals transmitted between said mobile station and one or more satellites, to a first location technique;

second providing[transmitting], to a second location technique remote from and independent of a movement of the mobile station, a second collection of measurements obtained from wireless signals transmitted between said mobile station and one or more fixed location terrestrial stations, at least when said first collection is not available, wherein said second collection includes signal time delay data of wireless signals transmitted between the mobile station and the fixed location terrestrial stations;

wherein said second location technique determines a location estimate of the mobile station by determining a locus of locations from at least one of the fixed location terrestrial stations, wherein for locations identified by said locus of locations, a signal time delay dependent condition is satisfied using the signal time delay data;

first obtaining first location information of said mobile station when said first location technique is supplied with an instance of said first collection;

second obtaining second location information of said mobile station when said second location technique is supplied with an instance of said second collection;

accessing at least one value related to a quality of at least one of said first location information and said second location information;

outputting, to a source requesting location data for said mobile station, resulting location information that is dependent upon: at least one of said first and second location information, and dependent upon said at least one value.

127. (Previously Added) The method as claimed in Claim 126, further including receiving a signal from the mobile station for determining a location of the mobile station.

128. (Previously Added) The method of Claim 126, wherein said step of outputting includes one of more of:

(a) sending said resulting location through a communications network to a known destination;

(b) prioritizing said first and second location information when both are available for locating the mobile station at substantially a same time;

(c) combining said first and second location information when both are available for locating the mobile station at substantially a same time.

Please amend Claim 129 as follows:

129. (Currently Amended) The method of Claim 126, wherein said signal time delay dependent condition includes obtaining [one of a triangulation and a trilateration using] one of a time of arrival and a time difference of arrival related to [of] wireless signals transmitted between the mobile station and the at least one of the fixed location terrestrial stations.

Please amend Claim 130 as follows:

130. (Currently Amended) The method of Claim 126, wherein at least one of said steps of first and second providing [transmitting] includes transmitting one of said first and second collections on at least a portion of the Internet.

Please amend Claim 131 as follows:

40 ~~131~~. (Currently Amended) A method for locating a mobile station using wireless signal measurements obtained from transmissions between said mobile station and a plurality of fixed location communication stations, wherein each of said communications stations includes one or more of a transmitter and a receiver for wirelessly communicating with said mobile station, comprising:

providing access to first and second mobile station location evaluators, wherein said location evaluators are able to determine information related to one or more location estimates of said mobile station when said location evaluators are supplied with data having values obtained from wireless signal measurements obtained via transmissions between said mobile station and the communication stations, wherein (A) and (B) following:

(A) said first location evaluator performs one or more of the following techniques (i), (ii) and (iii) when supplied with corresponding instances of said data, and for at least one mobile station $\mathbf{M}_k$ of a plurality of mobile stations that also includes the mobile station, said first location evaluator determines a geographical range for $\mathbf{M}_k$ using a delay time of a signal from at least one satellite to $\mathbf{M}_k$ for determining a spatial range between $\mathbf{M}_k$ and the at least one satellite;:

the above cited techniques include:

(i) a first technique for determining one of: (a) for at least one of the communication stations a wireless signal angle of arrival, and (b) for at least two of the communication stations, a time difference of arrival of wireless signals between the mobile station and the at least two communication stations from which for at least one of the two communication stations there is two way communications with the mobile station, wherein the two way communication uses one of: CDMA, TDMA, GSM, NAMPS and AMPS as a communication protocol;

(ii) a second technique for estimating a location of said mobile station, using values from a corresponding instance of said data obtained from signals received at the mobile station from one or more satellites;

(iii) a third technique for identifying a pattern of characteristics of a corresponding instance of said data, wherein said pattern of characteristics is indicative of a plurality of wireless signal transmission paths between the mobile station and each of a plurality of signal receivers, wherein said signal receivers are included in [antennas at] one or more of the communication stations; and

(B) for the one or more of said techniques performed by said first location evaluator, said second location evaluator performs a different combination of said one or more of said techniques

when supplied with corresponding instances of said data for the one or more techniques of said different combination;

first obtaining, from said first location evaluator, first location related information for identifying a location of the mobile station for at least one of the following situations: a tracking of the mobile station, and in response to a request for a location of the mobile station, wherein said first location evaluator uses one or more available first corresponding instances of said data for said one or more techniques performed by said first location evaluator;

second obtaining, from said second location evaluator, second location related information for identifying a location of the mobile station for said same at least one situation when said second location evaluator uses one or more available second corresponding instances of said data for said different combination of said techniques;

determining a resulting location information of the mobile station dependent upon at least one of: (a) a first value obtained from said first location related information, and (b) a second value obtained from said second location related information, wherein said resulting location information includes at least some of:

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(i) a value indicative of a likelihood of the mobile station being at a location represented by said resulting location information;

(ii) an identifier for identifying the mobile station;

(iii) data identifying [indicative of] one or more geographical extents [cells of a geographical partition], wherein each of the geographical extents has associated therewith [cells include] a location estimate (L) of the mobile station[represented by said resulting location information], wherein the one or more geographical extents provide additional information related to their associated location estimate L; and

(iv) a timestamp indicative of when the resulting location information corresponds to a location of the mobile station.

Please amend Claim 132 as follows:

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~~132~~. (Currently Amended) The method as claimed in Claim ~~131~~, wherein said mobile station is one of: (1) co-located with a processor for activating at least one of said location evaluators; and (2) includes a processor for activating at least one of said location evaluators.

Please amend Claim 133 as follows:

42 ~~133.~~ (Currently Amended) A method for locating a mobile station when there is an occurrence of at least one of: said mobile station being tracked, and a request for locating said mobile station, wherein said method uses wireless signal measurements obtained from transmissions between said mobile station and a plurality of fixed location communication stations, wherein each of said communication stations includes one or more of a transmitter and a receiver for wirelessly communicating with said mobile station, comprising:

providing access to first and second mobile station location evaluators, wherein said location evaluators determine information related to one or more location estimates of said mobile station when said location evaluators are supplied with data having values obtained using wireless signals obtained via transmissions between said mobile station and the communication stations, wherein (A) and (B) following:

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(A) said first location evaluator performs one or more of the following techniques (i), (ii) and (iii) when supplied with corresponding instances of said data:

(i) a first technique for estimating a location of said mobile station by using a wireless signal angle of arrival between the mobile station and at least one of the communication stations CS, wherein the wireless signal angle of arrival identifies a direction for the mobile station from CS;

(ii) a second technique for estimating a location of said mobile station using values from a corresponding instance of said data obtained from timing signals received at the mobile station from one or more satellites;

(iii) a third technique, wherein said third technique uses a statistical correlation for correlating (a) and (b) following:

(a) wireless signal related values of said corresponding [data] instance <u>of said data</u>; and

(b) [information indicative of a location for the mobile station, wherein said correlation is used for determining a probability that the mobile station is within at least one geographical area,] <u>data, D, wherein for each location L of a plurality of locations, said data D includes one or more wireless signal measurements</u>

related to a wireless communication between some mobile station that is substantially at L, and

wherein said correlation is used for determining a likely geographical range, GR, for a location for the mobile station and data indicative of a probability that the mobile station is within the likely geographical range GR; and

(B) for said one or more of said techniques performed by said first location evaluator, said second location evaluator performs a different combination of said one or more of said techniques when said second location evaluator is supplied with corresponding instances of data for the one or more techniques of said different combination;

wherein for locating at least one mobile station $\mathbf{M}_k$ of a plurality of mobile stations that also includes the mobile station, at least one of said first and second location evaluators determines a geographical range for $\mathbf{M}_k$ using a delay time of a signal from at least one of the satellites to $\mathbf{M}_k$ for determining a spatial range between said mobile station $\mathbf{M}_k$ and the at least one satellite;

first obtaining from said first location evaluator, first location related information of the mobile station's location for said occurrence using, when available, first corresponding instances of said data for each of said one or more said techniques performed by said first location evaluator;

second obtaining from said second location evaluator, second location related information of the mobile station's location for said occurrence using, when available, second corresponding instances of said data for said different combination;

wherein each of said first and second location related information is capable of being generated substantially independently of the other of said first and second location related information;

determining a resulting location estimate of the mobile station using at least one of (c) and (d) following: (c) a first value obtained from said first location related information, and (d) a second value obtained from said second location related information.

Please amend claim 134 as follows:

Please amend Claim 134 as follows:

134. (Currently Amended) A method for locating one or more mobile stations using wireless signal measurements obtained from transmissions between said mobile stations and a plurality of terrestrial communication stations, wherein each of said communication stations includes one or more of a transmitter and a receiver for wirelessly communicating with said mobile stations, comprising:

receiving a location request for a location of a first of the mobile stations, wherein the first mobile station is capable of providing wireless telephony transmissions, and a substantially same collection of components are in electronic contact with one another for performing each of at least most wireless telephony transmissions from the first mobile station;

generating one or more messages, for information related to a location of said first mobile station, said messages for requesting activation of one or more mobile station location estimators such that when said location estimators are supplied with corresponding input data having values obtained from wireless signal measurements obtained via transmissions between said first mobile station and the communication stations, said one or more location estimators perform at least two of the following techniques (i), (ii), (iii) and (iv):

(i) a first technique for determining, as a result, at least one location estimate or locus for said first mobile station by using an instance of said corresponding input data having timing measurements indicative of one of: a time of arrival of wireless signals, and a time difference of arrival of wireless signals between the first mobile station and at least one of the communications station CS for determining a range of the first mobile station from CS, said range varying with varying values of the timing measurements, wherein the signals for obtaining the timing measurements are communicated during a plurality of wireless signal transmissions between the first mobile station and CS, with at least one of the transmissions being from the first mobile station to CS, and wherein said first technique outputs the result from a site different from the location of the first mobile station;

(ii) a second technique for determining one or more candidate locations of the first mobile station, wherein each of said candidate locations is determined using, for at least some one of the communication stations CS, an instance of said corresponding input data for a wireless signal direction [angle] of arrival that is indicative of a direction of the wireless signal to CS from the first mobile station;

wherein for at least one occurrence when both said first and second techniques are used for locating the first mobile station at substantially a same location L, (1) and (2) following:

(1) at least one of said candidate locations is substantially unaffected by each said result obtained from every instance of said first technique performed by said location estimators for locating the first mobile station substantially at L, and

(2) at least one result from an instance of said first technique is substantially unaffected by each of said candidate locations for locating the first mobile station substantially at L;

(iii) a third technique for determining location information for said first mobile station, using timing values from an instance of said corresponding input data obtained from signals received at the first mobile station from a plurality of satellites, and wherein said corresponding input data also includes additional data for improving on location information for the first mobile station obtained from said satellite signals, wherein said additional data is received by the first mobile station in a wireless communication between said first mobile station and a communication station of a collection of one or more of the plurality of terrestrial communication stations, wherein each communication station of said collection is one of: (A) a fixed location base station of a commercial mobile radio service provider, and (B) operable for providing a wireless communication for responding to a telephony emergency call placed with the commercial mobile radio service provider;

(iv) a fourth technique, wherein said fourth technique determines [provides a pattern recognizer for estimating a location of said first mobile station by deriving said] a location estimate from a pattern of [multipath] wireless signal characteristics between: (a) one or more of the communication stations, and (b) said first mobile station;

wherein said fourth technique includes the steps of (c) and (d) following:

(c) accessing information obtained via an association that associates, for each of a plurality of geographical locations, (c1) and (c2) following:

(c1) a representation of the geographical location L, and

(c2) for the geographical location L, corresponding signal information indicative of at least one characteristic of a signal S previously transmitted between some mobile station, M_L, and one or more of the communication stations, when the some mobile station M_L transmitted S from approximately the geographical location L;

wherein for at least most of said geographical locations L, M_L is different from the first mobile station;

(d) determining one or more likely location estimates for the first mobile station from a similarity between (d1) and (d2) following:

(d1) data for one or more signal characteristics determined from wireless signals communicated between the mobile station M and the communication stations, wherein said signal characteristics include at least a first measurement of a first non-line of sight signal transmission

between the mobile station M and one of the communication stations, and

(d2) a portion of the accessed information that is indicative of the signal information of (a2);

first obtaining, from said one or more location estimators, first mobile station related location information obtained as a result of an available at least two instances of said corresponding input data being provided to their corresponding techniques of said first, second, third and fourth techniques;

wherein for locating at least a second mobile station $\mathbf{M}_k$ of the mobile stations, at least one of said one or more location estimators determines a geographical range for $\mathbf{M}_k$ using a delay time of a signal from at least one of the satellites to $\mathbf{M}_k$ for determining a spatial range between said mobile station $\mathbf{M}_k$ and the at least one satellite;

determining a resulting location estimate of the first mobile station obtained from said first mobile station related location information;

wherein at least one of said steps of receiving, generating, first obtaining, and determining includes a substep of one of: (i) transmitting information to a destination via a communication network, and (ii) receiving information from a source via a communication network.

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~~135~~. (Previously Added) The method of Claim ~~134~~, further including a step of outputting said resulting location estimate to a location identified by said location request.

Please amend claim 137 as follows:

~~137~~. (Currently Amended) A method for locating a mobile station M when there is at least one occurrence of:

(1) said mobile station M being tracked, and

(2) a request for locating said mobile station M,

wherein said method uses wireless signal measurements obtained from transmissions between said mobile station M and a plurality of fixed location communication stations, wherein each of said communications stations includes one or more of a transmitter and a receiver for wirelessly communicating with said mobile station M, comprising:

providing access to first and second mobile station location evaluators, wherein each of said location evaluators determine location information for locating said mobile station M when said location evaluator is supplied with data having values obtained from wireless signal measurements obtained via

transmissions between said mobile station M and the communication stations, wherein (A) and (B) following:

(A) said first location evaluator performs one or more of the following techniques (i), (ii), (iii) and (iv) when said techniques are supplied with a corresponding instance of said data:

(i) a first technique for determining a first resulting data related to a location of the mobile station M from a two way communication between the mobile station M and at least one of the communication stations CS, wherein one of: a wireless signal angle of arrival, and a time difference of arrival between the mobile station M and the at least one communication station is used in determining the corresponding instance of said data for determining said first resulting data;

(ii) a second technique for determining a second resulting data related to a location of the mobile station M, using timing values from a [the] corresponding instance of said data obtained from signals received at the mobile station M from one or more satellites;

(iii) a third technique for determining a third resulting data related to a location of the mobile station M by recognizing signal [multipath] characteristics from a [the] corresponding instance of said data, wherein said third technique includes the steps of (a) and (b) following:

(a) accessing information obtained from an association that associates [associating], for each geographical location (L) of a plurality of geographical locations, (a1) and (a2) following:

(a1) a representation of the geographical location L, and

(a2) for the geographical location L, corresponding signal [multipath] information indicative of at least one characteristic of a [multipath] signal[s] S previously transmitted between some mobile station, M_L, and one or more of the communication stations, when the some mobile station M_L transmitted S from approximately the geographical location L;

wherein for at least most of said geographical locations L, M_L is different from the mobile station M;

(b) determining one or more likely location estimates for the mobile station M from a similarity between (b1) and (b2) following:

(b1) data for one or more signal [multipath] characteristics determined from wireless signals communicated between the mobile station M and the communication stations, wherein said signal characteristics include at least a first measurement of a first non-line of sight signal transmission between the mobile station M and one of the communication stations, and

(b2) a portion of the accessed information that is indicative of the signal [multipath] information of (a2) [for a collection of one or more of the geographical locations]; and

(iv) a fourth technique for determining a fourth resulting data related to a location of the mobile station M, wherein said fourth technique statistically determines an expected location of the mobile station M by correlating (c) and (d) following:

(c) wireless signal related values obtained from a corresponding instance of said data, and

(d) [wireless signal data obtained from a plurality of known geographical locations] data, D, wherein for each location L of a plurality of locations, said data D includes one or more wireless signal measurements related to a wireless communication between some mobile station different from the mobile station M when the different mobile station is substantially at L,

wherein said correlation is used for determining a likely geographical range, GR, for a location for the mobile station M; and

(B) for said one or more of said techniques performed by said first location evaluator, said second location evaluator performs a different one or more of said first, second, third and fourth techniques when supplied with corresponding instances of said data for the one or more techniques of said different techniques;

first obtaining, from said first location evaluator, first location related information, for said at least one occurrence of M, when said one or more corresponding instances of data are available for said one or more techniques performed by first location evaluator;

second obtaining, from said second location evaluator, second location related information, for said at least one occurrence of M, when said one or more corresponding instances are available for said one or more techniques performed by second location evaluator;

wherein for locating at least one mobile station $\mathbf{M_k}$ of a plurality of mobile stations that also includes the mobile station M, at least one of said first and second location evaluators determines a geographical range for $\mathbf{M_k}$ using a delay time of a signal from at least one of the satellites to $\mathbf{M_k}$ for determining a spatial range between said mobile station $\mathbf{M_k}$ and the at least one satellite;

wherein for at least one substantially same location of the mobile station M, each of said first and second location related information is obtained[, and is obtained substantially independently from the obtaining of the other of said first and second location related information];

determining a resulting location estimate of the mobile station M dependent upon at least one of: (a) a first value obtained from said first location related information, and (b) a second value obtained from said second location related information.

Please amend Claim 138 as follows:

138. (Currently Amended) The method of Claim 137, wherein one or more of:

(a) said first technique includes a step of performing one of a triangulation and a trilateration;

(b) said third technique includes a step of activating an artificial neural network; and

(c) said fourth technique includes a step of performing one of: a principle decomposition analysis, a least squares analysis, and a partial least squares analysis[, and a procedure using Bollenger Bands].

Please amend claim 140 as follows:

140. (Currently Amended) A method for locating a mobile station using wireless signal measurements obtained from transmissions between said mobile station and at least one of a plurality of terrestrial transceivers capable of wirelessly detecting said mobile station, comprising:

providing access to at least two of the location techniques (a) through (c) following:

(a) a first technique for triangulating or trilaterating a location of the mobile station, wherein for each transceiver T of three or more of the transceivers, one of: a signal time of arrival, and a signal time difference of arrival between the mobile station and the transceiver T is determined using a first input obtained from the wireless signal measurements,

wherein for at least one of the three or more transceivers T_0, the signals for obtaining the wireless signal measurements are received at the transceiver T_0 during a plurality of wireless signal transmissions between the mobile station and the transceiver T_0, with at least one of the transmissions being from the mobile station to the transceiver T_0, and at least one of the transmissions being from the transceiver T_0 to the mobile station;

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(b) a second technique using a second input obtained from one or more transmissions between the mobile station and the transceivers, said second input including time delay measurements of signals received at the mobile station from one or more satellites;

(c) a third technique that determines a location of the mobile station by using a plurality of pairs of (i) and (ii) following:

(i) characteristics of wireless [multipath] signals communicated between some mobile station and one or more of the transceivers, and

(ii) a location of said some mobile station during the communication,

wherein when said third technique is supplied with a third input of characteristics of wireless [multipath] signals communicated between said mobile station and one or more of the transceivers, data indicative of a location of the mobile station is obtained from a similarity between the third input and the characteristics of wireless [multipath] signals of (c)(i);

determining whether at least said second technique [an accessible particular one of the location techniques (a) through (c)] has its corresponding input available for determining a first location estimate of said mobile station;

determining a second location estimate of said mobile station by activating an accessible one of said location techniques different from said second technique [particular location technique] when the corresponding input for said different technique is available;

receiving at least one of said first and second location estimates;

obtaining resulting location information for transmitting on a communications network, wherein said resulting location information is obtained using at least one of said first location estimate and said second location estimate;

wherein when said mobile station is at a first location, an instance of at least said first location estimate is used in said obtaining step for obtaining a first corresponding instance of said resulting location information, and when said mobile station is at a second location, an instance of at least said second location estimate is used in said obtaining step for obtaining a second corresponding instance of said resulting location information; and

wherein for at least one of the first and the second locations, [the corresponding performance of] said obtaining step includes one of: (1) a step of improving upon said instance of at least said first location estimate, and (2) a step of providing information indicative of an accuracy of said first corresponding instance of said resulting location information.

Please amend Claim 141 as follows:

141. (Currently Amended) The method as claimed in Claim ~~140~~, wherein at least two of said location techniques generate location estimates of said mobile station wherein neither of said at least two location techniques [that do not] depend upon the [one an]other one for their corresponding input to be available.

Please amend claim 142 as follows:

142. (Currently Amended) A method for locating a mobile station, M, of a plurality of mobile stations using wireless signal measurements obtained from transmissions between the mobile station M and at least one of a plurality of communication stations, wherein each of said communications stations includes one or more of a transmitter and a receiver for wirelessly communicating with each of the mobile stations, comprising:

providing access to at least first and second location estimators for estimating a location of the mobile station M, wherein for said first location estimator to estimate a location of the mobile station M, said first estimator is dependent upon a result from a first location technique that uses [included in] a first

set of one or more of the following (a) through (e) location technique categories and no other of the following (a) through (e) location technique categories, and for said second location estimator to estimate a location of the mobile station M, said second estimator is at least one of (A) and (B) following: (A) dependent upon a result from a second location technique included in a different one of the following (a) through (e) location technique categories[:] from the first set, and (B) uses at least one of the following location techniques (a) through (e) to obtain, for at least some instance of locating one of the mobile stations (M_j), a location estimate that is effectively different from a corresponding location estimate of M_j by said first location estimator;

the above cited first and second location techniques include one of more of:

(a) one of a trilateration and a triangulation technique for determining a location estimate of each mobile station (M_a) of at least some of the mobile stations at a site not co-located with the mobile station M_a, wherein for three or more of the communication stations in communication with the mobile station M_a, one of: a wireless signal time of arrival, and a wireless signal time difference of arrival between the mobile station M_a and the three or more communication stations is obtained using a first input obtained from timing measurements of the wireless signal measurements[,];

wherein for at least one of the three or more communication stations, CS, the timing measurements are obtained from signals communicated during a plurality of wireless signal transmissions between the mobile station M_a and CS, with at least one of the transmissions being from the mobile station M_a to CS;

(b) a stochastic technique for determining a location estimate of each mobile station (M_b) of at least some of the mobile stations, wherein said stochastic technique uses a statistical correlation for correlating (i) and (ii) following:

(i) a second input obtained from the wireless signal measurements, and

(ii) data, D, wherein for each location (L_B) of a plurality of locations, said data D includes one or more wireless signal measurements related to a wireless communication between some mobile station that is

substantially at L_B [data indicative of a location area for the mobile station,

wherein a probability that the mobile station is within the correlated location area is determined from said correlation];

wherein for at least most of said geographical locations L_B, said some mobile station is different from the mobile station M_b; and

wherein said correlation is used for determining a likely geographical range, GR, for a location for the mobile station M_b and data indicative of a probability that the mobile station M_b is within the likely geographical range GR;

(c) a learning technique for determining a location estimate of each mobile station (M_c) of more than one of the mobile stations, [for] by learning an association, wherein said association is determined by a training process using a plurality of data pairs, each said pair including: first information indicative of a location L_C of some mobile station (M_i), and second information from wireless signal measurements between said some mobile station M_i and one or more of the communication stations when said some mobile station M_i is at the location L_C,

wherein when said learning technique is supplied with a third input obtained from the wireless signal measurements obtained from transmissions between the mobile station M_c and at least one of a plurality of the communication stations, data indicative of a location for the mobile station M_c is determined;

(d) a pattern recognition location technique for estimating a location of each mobile station (M_d) of more than one of the mobile stations, wherein said pattern recognition location technique estimates a location of the mobile station M_d at a location (L_D) by recognizing a pattern of characteristics of a fourth input obtained from the wireless signal measurements, wherein said pattern of characteristics includes signal characteristic data [is] indicative of [multipath] wireless signal transmissions between the mobile station M_d and one or more of the communication stations; and

(e) a fifth location technique for determining a location estimate of each mobile station (M_e) of more than one of the mobile stations, wherein said fifth location technique uses [using] a fifth input obtained from measurements from signals received at the mobile station M_e from one or more non-terrestrial communication stations [satellites];

determining whether said first location estimator has its corresponding input available for determining a first location estimate of the mobile station M;

determining a second location estimate of said mobile station M by activating said second location estimator when the corresponding input for said second location estimator is available, and said corresponding input to said first location estimator is unavailable;

wherein for locating at least one mobile station M_k of the mobile stations, at least one of said first and second location estimators uses said fifth technique for determining a geographical range for M_k, wherein a delay time of a signal from at least one of the non-terrestrial wireless communication stations to M_k is used for determining a spatial range between M_k and the at least one non-terrestrial communication station;

obtaining resulting location information for transmitting on a communications network, wherein said resulting location information is obtained using at least one of said first location estimate and said second location estimate;

wherein when said mobile station M is at a first location, an instance of at least said first location estimate is used in said obtaining step for obtaining a first corresponding instance of said resulting location information, and when said mobile station M is at a second location, an instance of at least said second location estimate is used in said obtaining step for obtaining a second corresponding instance of said resulting location information; and

wherein for the first location, [said corresponding] a performance of said obtaining step includes one of: (1) a step of improving upon said instance of at least said first location estimate, and (2) a step of providing information indicative of an accuracy of said first corresponding instance of said resulting location information.

Please amend Claim 143 as follows:

143. (Currently Amended) The method as claimed in Claim 142, wherein

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said first, second, third, and fourth inputs include data related to one or more of: a wireless signal time delay, and a wireless signal strength[, and a power level of the mobile station]; and

said fifth input includes data related to GPS satellite signals.

Please amend claim 159 as follows:

51 ~~159~~. (Currently Amended) A method for locating [a] at least one mobile station, M, of a plurality of mobile stations, using wireless signal data obtained from transmissions between said mobile station M and at least one of a plurality of communication stations, each of the communication stations capable of at least one of: wirelessly detecting said mobile station M, and wirelessly being detected by said mobile station M, wherein at least some of said communication stations are able to provide voice communication with [a plurality] some of the mobile stations, including the mobile station M, comprising:

L9 receiving, for each mobile station (M_i) of: the mobile station M, and one or more additional ones of the mobile stations, wireless signal data obtained from transmissions between: (i) said communication stations, and (ii) said mobile station M_i at an unknown location, wherein said wireless signal data includes at least two of (A1) through (A3) following:

(A1) data obtained using signal timing measurements of wireless signal transmissions between said mobile station M_i and a set S_1 of one or more of said at least some communication stations at terrestrial locations, wherein for at least one of the [one or more] communication stations, CS, of the set S_1, there is a corresponding portion of the signal timing measurements that are obtained during a plurality of wireless signal transmissions between the mobile station M_i and CS, with at least one of the transmissions being from the mobile station M_i to CS;

(A2) data obtained using time delay measurements from wireless signal transmissions between [from] one or more non-terrestrial communication stations [satellites] and [to] said mobile station M_i [, each of the satellites having one of the communication stations];

(A3) signal [pattern] characteristic[s] data, D, of wireless signal transmissions between said mobile station M_i and a set S_3 of one or more of said communication stations, wherein (i) there is an archive including corresponding signal characteristic data for each of a plurality of known terrestrial locations in a wireless coverage area provided by S_3, (ii) said signal [pattern] characteristic[s] data D includes information [are indicative of a multipath] for determining one of a correspondence and a similarity with the corresponding signal characteristic data in the archive for at least some locations L of the plurality of locations, and (iii) for at least one of the locations L, said corresponding signal characteristic data for L is obtained from signal transmissions from a mobile station different from M_i [signal pattern at the unknown location between the mobile station and at least one of the communication stations];

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generating a location estimate for the unknown location of said mobile station M, said location estimate dependent upon a geographical extent output from a corresponding instance of each of at least (B2) following, and one other [two] of the following location techniques (B1) and [through] (B3) [following]:

(B1) a first technique that determines location information indicative of a range between at least one of the communication stations and a mobile station being located;

wherein for locating the mobile station M, said corresponding instance of said first technique uses the corresponding measurements from (A1) for M and an instance of the set S_1 including one of the terrestrial communication stations CS_M to determine a range between the mobile station M and the communication station CS_M [at a site different from the unknown location of the mobile station M];

(B2) a second technique that determines location information indicative of a range between a non-terrestrial communication station [satellite], and a mobile station being located;

wherein for locating the mobile station M, said corresponding instance of said second technique uses the corresponding measurements from (A2) for M and a non-terrestrial communication station [satellite] S[, having one of the communication stations,] to determine a range between the mobile station M and the non-terrestrial communication station [satellite] S;

(B3) a third technique that determines location information indicative of a [recognized] wireless signal similarity or correspondence [pattern] for transmissions between the communication stations and a mobile station being located;

wherein for locating the mobile station M, said corresponding instance of said third technique uses: (i) the [corresponding] signal [pattern] characteristics D from (A3) for M, and (ii) the archive of (A3).

Please amend Claim 160 as follows:

52 160. (Currently Amended) The method as claimed in Claim 51 159, wherein said step of generating includes performing a stochastic technique for generating said location estimate of said mobile station M, wherein said stochastic technique uses a statistical correlation for correlating (1) and (2) following:

(1) information obtained from at least one of signal strength and signal time delay measurements of wireless signals between the mobile station M and the communication stations, and

(2) data, U, wherein for each location L of a plurality of locations, said data U includes one or more wireless signal measurements related to a wireless communication between some mobile station different from the mobile station M when the different mobile station is substantially at L, and ,

wherein said correlation is used for determining a likely geographical range, GR, for a location for the mobile station M and data indicative of a probability that the mobile station M is within the likely geographical range GR [:

(i) measurements from said wireless signal data, and

(ii) previously obtained wireless signal data indicative of a plurality of known mobile station locations;

wherein said stochastic technique determines a probability that said unknown location is within a geographic area].

Please amend Claim 161 as follows:

53 ~~161.~~ (Currently Amended) The method as claimed in Claim 51 ~~159~~, wherein said step of generating includes providing at least one instance of said signal [pattern] characteristic[s] data D of (A3) for M to a pattern recognizer included in said third technique instance that is trainable when repeatedly provided with previously obtained wireless signal data indicative of a plurality of known mobile station locations.

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Please amend claim 163 as follows:

54 ~~163.~~ (Currently Amended) A mobile station location system, comprising:

a gating module for communicating with two or more mobile station location estimating sources for determining corresponding geographic extents for locations of a plurality of mobile stations, such that for each said estimating source (ES), there is a corresponding plurality of at least some of the mobile stations, wherein for each mobile station M of the corresponding plurality of at least some of the mobile stations, when ES is [said one or more estimating sources are] supplied with corresponding data obtained from measurements of wireless signals transmitted between the mobile station M, and at least one of (1) and (2) following:

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(1) a plurality of communication stations capable of at least one of: wirelessly detecting said mobile stations, and being wirelessly detected by said mobile stations, and

(2) one or more non-terrestrial wireless signal transmitting stations,

then ES [for said one or more location estimating sources supplied with their corresponding data, each such source] outputs a corresponding geographic extent of a geographical location of the mobile station M;

wherein for a first of said mobile station location estimating sources (ES1), when estimating a location of one of the mobile stations of the corresponding plurality of mobile stations for ES1, said ES1 [first source] is dependent upon a result from a first component included in one of the following (a) through (e) component categories, and for a second of said mobile station location estimating sources (ES2), when estimating a location of one of the mobile stations of the corresponding plurality of mobile stations for ES2, said ES2 [second source] is dependent upon a result from a second component[included in a different one of the following (a) through (e) component categories], wherein for at least one instance of locating one of the mobile stations said second component is categorized in one of the of the following (a) through (e) component categories that said first component can not be categorized[,

wherein for at least one instance of locating one of the mobile stations, said first and second sources provide different geographic extents]:

(a) a first category of [pattern recognition] components, wherein each said [pattern recognition] component of said first category estimates a geographic extent for a location of one of the plurality of mobile stations, M_a, by identifying a similarity between (i) and (ii) following: (i) at least a portion of an archive of signal characteristic data for each of a plurality of known locations in a wireless coverage area provided by the communication stations, and (ii) [from a pattern of multipath] signal characteristics, including a plurality of time delayed signal strengths of wireless signals, communicated between M_a and at least one of the communication stations;

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wherein said similarity is dependent upon at least the corresponding signal characteristic data (D) for one of the known locations such that D is obtained using signal transmissions from another mobile station of the plurality of mobile stations different from M_a;

(b) a category of trainable mobile station location estimating components for determining geographic extents for locations of at least some of the plurality of mobile stations[,];

wherein each said trainable mobile station location estimating component is capable of being trained to associate: (i) each location, L, of a plurality of geographical locations with (ii) corresponding measurements of wireless signals transmitted between: some one of said plurality of mobile stations (M_L), and at least one of the plurality of communication stations, wherein said [some] mobile station M_L is approximately at the location L;

(c) a category of locus computing components for determining geographic extents for locations of at least some of the plurality of mobile stations, each of said locus computing components used for outputting geographic extents for locating more than one mobile station of the [a] plurality of [different] mobile stations,

wherein each of said locus computing components, when determining a geographic extent for a location of one of the plurality of mobile stations (M_c), utilizes timing measurements for determining a locus of locations for said mobile station M_c, wherein the

timing measurements are from said corresponding data for said locus computing component locating M_c, and

wherein said timing measurements are a function of a signal time delay between the mobile station M_c, and at least one of the communication stations CS, said communication station CS being secured to a fixed terrestrial location [attached to the ground], and

wherein there is a portion of the timing measurements that are obtained during a plurality of wireless signal transmissions between the mobile station M_c and CS, with at least one of the transmissions being from the mobile station M_c to CS;

(d) a category of direction [angle] of arrival components for determining geographic extents for locations of at least some of the plurality of mobile stations, wherein each of said direction [angle] of arrival components, when determining a geographic extent for a location of one of the plurality of mobile stations (M_d), determines the geographic extent for the mobile station M_d using a direction from which wireless signals arrive at at least one of the communication stations from the mobile station M_d;

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(e) a category of signal processing components, wherein each of said signal processing components (SPC), when determining a geographic extent for a location of one of the plurality of mobile stations (M_e), uses wireless signals (S) received at the mobile station M_e from the non-terrestrial transmitting stations, wherein said wireless signals S provide time values, and said signal processing component[s] SPC determines the geographic extent for M_e using at least one elapsed [differential between the] time value[s] for the wireless signals S [transmitted by a plurality of the non-terrestrial transmitting stations];

wherein for locating one of the plurality of mobile stations (M_0), said gating module communicates on a communications network with at least one of said two or more location estimating sources for providing said location system with said corresponding geographic extent (E_1) obtained from the at least one estimating source, E_1 being for a location L_0 of the mobile station M_0; and

a resulting estimator for determining a likely location estimate [of the location L] of the mobile station M_0 by accessing first data obtained from E_1 and second data [using two or more of said

corresponding geographic extents for the mobile station M,] obtained from said corresponding geographic extent (E_2) obtained from one of said location estimating sources different from the location estimating source providing E_1, and wherein said resulting estimator activates [activating] at least one of: (i) a selector for giving preference[,] to one of first and second data as more indicative of a [the] location [L] of M_0[, to at least one geographic extent obtained from said corresponding geographic extents], and (ii) a combiner for combining said two or more corresponding geographic extents for said first and second data in obtaining said likely location estimate;

wherein at least one of the location estimating sources for E_1 and E_2 is dependent upon a component from the category (e)..

55 ~~164~~. (Previously Amended) The location system, as claimed in Claim ~~163~~ 54, wherein one or more of said estimating sources are capable of being at least one of: added, replaced and deleted by transmissions on a communication network between a portion of said location system and a site remote from said portion.

Please amend claim 165 as follows:

56 ~~165~~. (Currently Amended) The location system as claimed in Claim ~~163~~ 54, wherein at least some of the following limitations hold [one or more of]:

(a) at least one of said one or more corresponding geographic extents, GE, has a corresponding value therewith indicative of a likelihood that the mobile station M_0 resides in a geographical area represented by GE, and said combiner uses said corresponding value for obtaining said likely location estimate;

(b) said gating module activates a wireless transceiver for communicating with the plurality of communication stations;

(c) said plurality of communication stations includes base stations for wireless two way communication with said mobile stations;

(d) said non-terrestrial wireless signal transmitting stations include GPS satellites;

(e) said first category of [pattern recognition] components includes [at least one of: an expert system, and an artificial neural network] a component (C_e) that compares a value of a wireless signal waveform obtained from at least one wireless signal measurement of the archived signal characteristic data with a corresponding wireless signal waveform value of a wireless communication between M_a and at least one of the communication stations, wherein C_e is used in determining E_1;

(f) said trainable mobile station location estimating components includes a component (C_f) for one of interpolating and extrapolating from the locations L of (b)(i) to obtain a geographic extent of one of the mobile stations, wherein C_f is used in determining E_1 [an artificial neural network];

(g) said communications network provides for a transmission with the at least one of said two or more location estimating sources via [includes a portion of] the Internet;

(h) the mobile station M_0 has an ability to communicate with other of the mobile stations as a base station;

(i) said selector includes a component [filter] for reducing a dependence of said likely location estimate on one of the corresponding geographic extents;

(j) said resulting estimator is at least partially included in a mobile base station;

(k) said resulting estimator resides at a location center;

(l) said gating module resides at a location center;

(m) said gating module routes activation information to said two or more estimating sources; and

(n) said gating module resides at a mobile station.

166. (Previously Amended) The location system as claimed in Claim ~~163~~ 54, wherein the plurality of communication stations provide communications to a portion of the Internet, and said interface uses a TCP/IP protocol for receiving said corresponding location estimate from said at least one estimating source.

~~167~~. (Previously Amended) The location system as claimed in Claim ~~163~~ 54, further including an output gateway for receiving said likely location estimate and obtaining network information related to one or

more location receiving applications for transmitting an output, corresponding to said likely location estimate, on one or more communications networks to said one or more location receiving applications.

168. (Previously Amended) The location system as claimed in Claim 167, wherein said one or more location receiving applications includes applications for one of: 911 emergency, parolee surveillance, vehicle location, locating related persons, locating animals, providing a person at said mobile station M with information indicative of his/her location.

Please amend claim 169 as follows:

169. (Currently Amended) A mobile station location system for locating a plurality of mobile stations (Σ), comprising:

a communications controller for [selectively] communicating with a plurality of mobile station location estimating sources for at least one of (1) and (2) following:

(1) activating [a selected] one or more of said mobile station location estimating sources; and

(2) receiving location related information for locating at least some of the plurality of mobile stations Σ;

wherein for each said estimating source (ES), there is a corresponding one or more of the mobile stations Σ, such that for each mobile station M [of at least some] of the corresponding one or more of the mobile stations, when ES is [one or more of said location estimating sources are] supplied with corresponding data obtained from measurements of wireless signals transmitted between (i) and (ii) following:

(i) the mobile station M, and

(ii) at least one of (ii-a) and (ii-b) following: (ii-a) a [network] plurality of communication stations [cooperatively linked] for use in locating the mobile stations Σ, and (ii-b) one or more non-terrestrial wireless signal transmitting stations,

then ES [each such source supplied with its corresponding data,] outputs a corresponding one or more location estimates of a geographical location of the mobile station M;

wherein for a first of said mobile station location estimating sources (ES1), when estimating a location of one of the mobile stations of the corresponding one or more mobile stations for ES1, said ES1

[first source] is dependent upon a result from a first component included in one of the following (a) through (c) component categories, and for a second of said mobile station location estimating sources (ES2), when estimating a location of one of the mobile stations of the corresponding one or more mobile stations for ES2, said second source is dependent upon a result from a second component included in a different one of the following (a) through (c) component categories, wherein for at least one instance of locating one of the mobile stations Σ, said first and second sources provide different location estimates:

(a) a first category of [pattern recognition] components, wherein each of said [pattern recognition] components of said first category, when estimating a location of one of the mobile stations M_a of Σ, estimates a location of the mobile station M_a by identifying a similarity between (i) and (ii) following: (i) at least a portion of an archive, said portion including signal characteristic data for each of a plurality of known locations in a wireless coverage area provided by the communication stations, and (ii) [from a pattern of wireless] signal characteristics including a plurality of time delayed signal strengths of the wireless signal measurements, communicated between M_a and at least one of the communication stations;

L10

wherein said similarity is dependent upon at least the corresponding signal characteristic data D for one of the known locations such that D is obtained using signal transmissions from another mobile station of the plurality of mobile stations;

(b) a second category of [triangulation] components, wherein each of said [triangulation] components of said second category, estimates locations of each mobile station M_b of a plurality [of different ones] of the mobile stations of Σ [, wherein each said triangulation component utilizes] utilizing timing measurements of wireless signals between the mobile station M_b and [three of] the communication stations for determining a geographical range [location estimate] of the mobile station M_b from one of the communication stations, CS,

wherein said timing measurements are a function of a signal time delay between the mobile station M_b, and [at least one communication station] CS [of the three communication stations],

wherein said communication station CS is attached to the ground, and

wherein there is a portion of the timing measurements that is obtained during a plurality of wireless signal transmissions between the mobile station M_b and CS, with at least one of the transmissions being from the mobile station M_b to CS;

(c) a category of signal processing components, wherein each of said signal processing components, when estimating a location of one of the mobile stations M_c of Σ, uses wireless signals S received at the mobile station M_c from the non-terrestrial transmitting stations, wherein said wireless signals S provide time values, and said signal processing components [determine at least one] obtain a spatial range between M_c and one of the non-terrestrial transmitting stations using an elapsed time [differential between the time values for the] of said wireless signals S transmitted from the one [by a plurality of the] non-terrestrial transmitting station[s];

L10

an interface in communication with said controller for locating at least one mobile station M_0, that is an instance of M, said interface for communicating on a communications network with at least [one of] said first [and second] location estimating source[s] ES1 for thereby at least one of (3) and (4) following:

(3) requesting activation of said first [at least one] location estimating source, and

(4) receiving first location information, from said first [at least one] location estimating source, said corresponding location estimate (E_1) of the mobile station M_0 included in said first location information;

a resulting estimator for determining a likely location estimate of a location L_0 of the mobile station M_0, wherein said resulting estimator accesses first data obtained from said location first information, and second data obtained [using two or more of said corresponding location estimates for the mobile station M at L] from said second location estimating source ES2, wherein said resulting estimator activates [includes] at least one of (iii) and (iv) following:

(iii) a selector for giving preference, as more indicative of the location L_0, to at least one of said first data and said second data [preferred location estimate obtained from said corresponding location estimates]; and

(iv[ii]) a combiner for obtaining said likely location estimate as a function of said first data and said second data [two or more of said corresponding location estimates]; wherein at least one of first data and said second data is dependent upon an activation of a component from the category (c).

Please amend claim 170 as follows:

170. (Currently Amended) The mobile station location system of Claim ~~169~~ 60, wherein [said network] at least some of said communication stations provide[s] non-location related communications with M_0 [by at least one of: (a) wirelessly, (b) via a portion of the Internet, and (c) the network of communication stations].

Please amend claim 172 as follows:

172. (Currently Amended) The mobile station location system of Claim ~~169~~ 60, further including at least one data base having performance information indicative of a performance of at least one of said first and second [mobile station] location estimating sources, LE_i in providing previous location estimates of the mobile stations, wherein said performance information is used for determining a measurement of a likelihood of the mobile station M_0 being in a geographical location represented by a location estimate output by LE.

Please amend Claim 179 as follows:

179. (Currently Amended) A method for locating a wireless mobile station, comprising:

repeatedly performing the following steps (A1) through (A3) for tracking the mobile station;

(A1) receiving a location estimate of the mobile station, said location estimate obtained from using at least one of (a) and (b) following:

(a) first data obtained from wireless timing signals received by the mobile station from one or more satellites, wherein said timing signals from each of the one or more satellites identify a locus of locations of the mobile station; and

(b) second data obtained from time delays of wireless signals transmitted between the mobile station and one or more transceivers of a plurality of terrestrial transceivers cooperatively linked together for use in locating the mobile station, wherein said time delays identify a locus of locations of the mobile station from at least one of the transceivers, and wherein for one of the one or more transceivers, a corresponding one of the time delays is [are] obtained from signals transmitted during a plurality of wireless signal transmissions between the mobile station and the one transceiver, with at least one of the transmissions being from the mobile station to the one transceiver;

L12 cncld

wherein an instance of each of (a) and (b) is used at some time during the tracking of the mobile station for determining a respective location of the mobile station;

(A2) determining a likely location of the mobile station by determining a likely roadway upon which the mobile station is located; and

(A3) providing information indicative of said likely location for displaying on a display device.

64 ~~180.~~ (Previously Added) The method of Claim ~~85~~ 1, wherein for at least said mobile station M, said manner by which said first and second estimators determine said first and second likely geographical ranges is such that said first and second likely geographical ranges are determined independently of one another.

Please amend Claim 182 as follows:

65 ~~182.~~ (Currently Amended) The method of Claim ~~85~~ 1, wherein said at least one communication station transmits a first wireless signal to the mobile station M and receives in response to said first wireless signal, a responsive signal from the mobile station M, and any intermediary devices for transmitting signals between said mobile station M and the communication stations are terrestrial.

L13

Please amend claim 183 as follows:

66 ~~183.~~ (Currently Amended) The method of Claim ~~182~~ 65, wherein said plurality of communication stations includes at least some communication stations that are able to provide voice communication between the mobile station M and another party, wherein the communication travels through a public switched telephone network, and the mobile station M is hand-held.

67 66
~~184.~~ (Previously Added) The method of Claim ~~183~~, wherein said communication between the mobile station M and the another party uses one of the following wireless transmission techniques: CDMA, TDMA, GSM, AMPS, and NAMPS.

68 1
~~185.~~ (Previously Added) The method of Claim ~~85~~, further including providing a wireless transmission to a second mobile station, wherein said second mobile is capable of moving toward the mobile station M by using said wireless transmission for locating M.

Please amend claim 186 as follows:

69 1
~~186.~~ (Currently Amended) The method of Claim ~~85~~, wherein said first [angulation] technique determines both (a) and (b) following: (a) said distance between a first instance of the at least one communication station CS and the mobile station M, and (b) a [said] wireless signal direction [angle]-of-arrival between the mobile station M and a second instance of the at least one communication station CS.

L13 cancel

Please amend Claim 187 as follows:

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~~187.~~ (Currently Amended) The method of Claim ~~97~~, wherein said one or more location evaluators perform all [at least] three of the techniques (i), (ii) and (iii) in said step of obtaining.

71 11
~~188.~~ (Previously Amended) The method of Claim ~~97~~, wherein said mobile station M includes a mobile telephone that communicates with at least some of said communication stations using one of the following wireless transmission techniques: CDMA, TDMA, GSM, AMPS, and NAMPS.

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~~190.~~ (Previously Added) The method of Claim ~~99~~ further including a step of receiving at least one of said first, second, third and fourth input from a commercial mobile radio service provider (CMRS).

L14 73 13
~~191.~~ (Previously Added) The method of Claim ~~99~~, wherein said third technique uses a time difference of arrival of wireless signals transmitted between the mobile station M3 and the communication station CS for determining a locus of points having a hyperbolic shape.

Please amend Claim 192 as follows:

74 ~~192~~. (Currently Amended) The method of Claim ~~99~~ 13, wherein the communication station CS transmits a first wireless signal to the mobile station M3 and receives in response to said first wireless signal, a responsive signal from the mobile station M3, and any intermediary devices for transmitting signals between the M3 and the communication stations are terrestrial.

75 ~~193~~. (Previously Added) The method of Claim ~~99~~ 13, wherein said step of first transmitting includes responding to an Internet request to locate the first mobile station.

L14 Cancel Please amend Claim1 194 as follows:

76 ~~194~~. (Currently Amended) The method of Claim ~~193~~ 75, wherein the first mobile station is a [moving] vehicle.

77 ~~195~~. (Previously Added) The method of Claim ~~97~~ 11, wherein said third technique includes performing one of: a least squares process, partial least squares process, and a principle decomposition process.

Please amend claim 197 as follows:

78 ~~197~~. (Previously Added) The location system of Claim ~~100~~ 14, wherein said location determiner includes a snap to route module, wherein said resulting location information of said mobile station M identifies a vehicle route near an intermediate location determined using said likely geographical location LE.

L15

79 ~~198~~. (Previously Added) The method of Claim ~~100~~ 14 further including a step of transmitting said resulting location estimate via one of the Internet and a telephony network.

80 ~~199~~. (Previously Added) The method of Claim ~~85~~ 1 further including a step of transmitting said resulting location estimate via one of the Internet and a public switched telephone network.

81 ~~200~~. (Previously Added) The method of Claim ~~97~~ 11, wherein said step of first transmitting includes transmitting said resulting information via one of the Internet and a network supporting voice communication.

82 15

201. (Previously Added) The method of Claim 101 further including a step of transmitting said further location estimate via one of the Internet and a public switched telephone network.

L15 cncl'd 83 19

202. (Previously Added) The method of Claim 106, wherein at least one of said adaptable location estimators adapts by one of:

learning an association for associating, for each of at least some of said data collections, said geographical location representation (a1) of the data collection with said set of said wireless signal measurements (a2) of the data collection; and

determining a statistical similarity between (b1) and (b2) following: (b1) wireless signal measurements obtained from transmissions between said mobile station M and the network, and (b2) said wireless signal measurements (a2) of the data collections in said archive.

Please amend claim 245 as follows:

84 26

245. (Currently Amended) The method of Claim 117, [wherein the step of determining] further including a step of determining a resulting location [includes] for at least one mobile station, different from or one of the first and second mobile stations, by obtaining a third value from a performance of [performing] a third technique for determining a likely location of [the] at least one of a plurality of mobile stations (M), wherein (c) - (e) following hold:

L16

(c) the third technique is dependent upon multipath data, wherein the multipath data is obtained from wireless signal multipath information communicated between the mobile station M and the transceivers,

(d) the third technique is dependent upon (d1) and (d2) following: (d1) a representation of each of a plurality of geographical locations, and (d2) for each of the geographical locations, corresponding multipath information previously obtained using transmissions between some mobile station, different from M, and the transceivers, when the some mobile station transmitted from approximately the geographical location, and

(e) the third technique determines one or more of the geographical location representations that are likely to be approximate to at least one location of the mobile station M.

Please amend Claim 247 as follows:

85 247. (Currently Amended) The method of Claim 121, wherein said communication between the mobile station and the one terrestrial station[s] uses one of: CDMA, TDMA, GSM, and NAMPS.

86 248. (Previously Added) The method of Claim 133, further including a step of:

providing communication between the mobile station and another party via at least one of the communication stations, wherein the communication travels through a network that supports voice communication.

87 249. (Previously Added) The method of Claim 137, further including the steps of:

providing communication between the mobile station and another party via at least one of the communication stations, wherein the communication travels through a public switched telephone network;

requesting one or more of the location estimates in response to signals received from a commercial mobile radio service provider wirelessly communicating with the mobile station;

transmitting, via at least one of a public switched telephone network and the Internet, at least one location of the mobile station to one of: a public safety answering point, a police unit, and a party requesting the location of the mobile station.

88 251. (Previously Added) The method of Claim 85, wherein at least one of said first and second location estimators utilize a technique for estimating a location of said mobile station M using values from said corresponding input data obtained from timing signals received at the mobile station M from one or more non-terrestrial communication stations.

89 252. (Previously Added) The method of Claim 190, wherein for said third technique, the at least one communication station CS is one of: included in, and co-located with a base station of said CMRS, wherein CS is in two way communication with the mobile station M3.

Please amend claim 253 as follows:

90 253. (Currently Amended) The method of Claim 97, further including, following said step of obtaining, [wherein at least one of said second and third techniques includes] a step of [second determining a likely geographical location of the mobile station M, wherein one or more of (d1) - (d3) following hold:

(d1) the step of second determining is dependent upon multipath data of the corresponding input data, wherein the multipath data is obtained from wireless signal multipath information communicated between the mobile station M and the communication stations,

(d2) the step of second determining is dependent upon (i) and (ii) following: (i) a representation of each of a plurality of geographical locations and (ii) for each of the geographical locations, corresponding multipath information previously obtained using transmissions between some mobile station and the communication stations, when the some mobile station transmitted from approximately the geographical location,

(d3) the step of second determining includes a step of] selecting at least one of the one or more [of the geographical] location estimates [representations] that are likely to be approximate to the unknown location.

Please cancel Claim 254.

Please amend Claim 255 as follows:

255. (Currently Amended) The location system of Claim 103, wherein for each occurrence of at least a majority of occurrences of locating one or more mobile stations, said first location estimator and said [one] second location estimator output location estimates that are effectively substantially representing a same location.

256. (Previously Added) The location system of Claim 103, wherein said output gateway includes an interface to one of: the Internet and a telephony network.

257. (Previously Added) The location system, as claimed in Claim 103, wherein said location estimate adjuster includes a statistical simulation module for deriving one or more likelihood values indicative of said additional location estimate representing the geographical location of M.

Please amend claim 258 as follows:

258. (Currently Amended) The location system of Claim 106, [further including:] wherein said interface includes a network interface for receiving a request[s] for locating, at one or more locations, the mobile station M via the Internet; and further including an output gateway for transmitting, via the

L18 cancld

Internet to a particular Internet [one of a plurality of] destination[s providing a request to locate one of the mobile stations], a resulting location estimate for the mobile station M, wherein said resulting location estimate is dependent upon one or more location estimates determined by a selected one of said plurality of location estimators, and wherein said resulting location estimate is determined according to an output criteria for the one destination, said output criteria including one or more of: a representation of an accuracy of said resulting location estimate, and a frequency of providing the one destination with one or more instances of said resulting location estimates.

Please cancel claim 259.

L19 95 26

261. (Previously Added) The method of Claim ~~117~~, further including a step of transmitting each of said resulting location information on a communication network.

96 27

263. (Previously Added) The method of Claim ~~118~~, wherein at least one occurrence of said step of outputting includes transmitting said resulting location information via a telephony network.

Please amend claim 264 as follows:

99 28

L20 264. (Currently Amended) The method of Claim ~~119~~, further including a step of outputting said resulting location estimate to a destination [accessible] via a communications network.

Please amend claim 265 as follows:

98 97

265. (Currently Amended) The method of Claim ~~264~~, wherein said destination is the [one] mobile station M_1.

99 30

266. (Previously Added) The method of Claim ~~121~~, further including a step of:

providing communication between the mobile station and another party via at least one of the terrestrial stations, wherein the communication travels through a telephony network.

100 30

267. (Previously Added) The method of Claim ~~121~~, further including the steps of:

requesting one or more of the resulting location estimates via signals transmitted by a commercial mobile radio service provider that wirelessly communicates with the mobile station;

transmitting, via a communication network, at least one location of the mobile station to one of: the mobile station, another mobile station, a police unit, a vehicle, and a party requesting the location of the mobile station.

101 35

268. (Previously Added) The method of Claim 126, further including communicating with an emergency response center during an occurrence of an emergency request in which said resulting location estimate is used.

102 40

269. (Previously Added) The method of Claim 131, further including a step of transmitting said resulting location estimate on a communications network to a destination requesting the location of the mobile station.

Please amend Claim 270 as follows:

120 103 42

270. (Currently Amended) The method of Claim 133, wherein said step of determining includes a step of <u>determining</u> [identifying] one or more subareas for said resulting location and a corresponding likelihood of the mobile station being in each of the subareas, said one or more subareas selected from a predetermined plurality of subareas [of a larger mapped area].

104 42

271. (Previously Added) The method of Claim 133, further including requesting one or more of the first and second location related information in response to signals received from a commercial mobile radio service provider wirelessly communicating with the mobile station.

105 42

272. (Previously Added) The method of Claim 133, further including transmitting, via a communication network, at least one location of the mobile station to one of: the mobile station, a public safety answering point, a police unit, and a party requesting the location of the mobile station.

Please amend Claim 273 as follows:

106 13

273. (Currently Amended) The method of Claim 99, wherein: <u>at least one of said steps (A) and (B) below are performed when (1) through (3) following hold: (1)</u> for said at least one [of said location]

technique[providing a first member said first set] outputting data (D_1) related to a geographical location of said first mobile station, and (2) for at least a different one of said [location]techniques providing data (D_2) related to a geographical location of said second mobile station for[a second member of] said [second]set, and (3) D_1 and D_2 each including information indicative of at least one of: a location accuracy, a location likelihood, an environmental condition of a location, a timestamp of a location, a location processing performed, a description of a location processing performed:

(A) receiving from [there is] a common predetermined interface [at which] both D_1 and D_2 [said first and second members are received]; and

(B) receiving in a common predetermined data representation both D_1 and D_2.

120

Please amend Claim 274 as follows:

107 274. (Currently Amended) The method of Claim 99, wherein [said first set includes said first data, and] said [second] set includes said third data for the second mobile station.

108 275. (Previously Added) The method of Claim 274 wherein said at least one technique is said third technique.

109 276. (Previously Added) The method of Claim 274 wherein said at least one technique is said first technique.

Please amend Claim 277 as follows:

110 277. (Currently Amended) The method of Claim 99, wherein said steps of first and second determining use at least one common mobile station location related component for determining, respectively, said first output location data and said second output location data, wherein said component accesses the first and second output criteria for determining, respectively, said first and second output location data.

111 278. (Previously Added) The method of Claim 99, wherein said steps of first and second transmitting includes outputting said first and second output location data via a common predetermined network interface.

279. (Previously Added) The method of Claim 99, wherein said first determining step includes accessing mobile station location output frequency information of said first output criteria.

280. (Previously Added) The method of Claim 99, wherein said first determining step includes determining a coarse location estimate of the first mobile station as a portion of said first output location data, wherein a subsequent location estimate of the first mobile station is an improvement thereof.

281. (Previously Added) The method of Claim 99, wherein at least one of said first determining and said first transmitting steps includes determining a particular protocol for outputting said first output location data on the communication network for transmission to the corresponding destination for the first request.

282. (Previously Added) The method of Claim 99, wherein said first output criteria includes information for determining said representation of said first geographical range using a location of a known geographical feature different from the communication stations.

283. (Previously Added) The method of Claim 282, wherein the known geographical feature includes a roadway, and said determining step includes snapping to the roadway.

Please amend Claim 284 as follows:

284. (Currently Amended) The method of Claim 99, wherein said corresponding destination for said first location request is for a first use [application], and said corresponding destination for said second location request is for a second use [application], wherein said first and second uses [applications], respectively, use said first and second output location data differently.

Please amend Claim 285 as follows:

285. (Currently Amended) The method of Claim 284, wherein each of said first and second uses [applications are] is for [corresponding different] one[s] of the following: (i) responding to emergency calls, (ii) tracking mobile stations, (iii) routing mobile stations, (iv) determining one of: people and

animal locations including applications for confinement to or exclusion from certain areas, (v) performing parolee surveillance, and (vi) responding a mobile station user's request for the user's location.

Please amend Claim 286 as follows:

119 117

286. (Currently Amended) The method of Claim 284, wherein said first output criteria includes information for determining a first location granularity at which a location estimate of the first mobile station is transmitted in said first output location data, wherein said first location granularity is dependent upon said first use [application], and said second output criteria includes information for determining a second location granularity at which a location estimate of the second mobile station is transmitted in said second output location data, wherein said second location granularity is dependent upon said second use [application].

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Please amend Claim 287 as follows:

120 117

287. (Currently Amended) The method of Claim 284, wherein said first output criteria includes information for determining a first representation for said first output location data, wherein said first representation is dependent upon said first use [application], and said second output criteria includes information for determining a second representation for said second output location data, wherein said second representation is dependent upon said second use [application].

Please cancel Claims 288 and 289.

Please amend Claim 290 as follows:

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290. (Currently Amended) The method of Claim 99, wherein at least one of said steps of receiving, first obtaining, second obtaining, first transmitting, and second transmitting receives or transmits wireless location related information on a TCP/IP network.

122 13

291. (Previously Added) The method of Claim 99, wherein said step of first obtaining includes receiving a first location estimate from a first of said location determining sources which performs an instance, I_1, of said first technique for estimating a location of the first mobile station, wherein said instance I_1 uses wireless signals, S, between the first mobile station and at least one of the communication

stations to improve at least one performance characteristic of said instance I_1 over a performance of I_1 without use of the wireless signals between the first mobile station and the at least one communication station.

292. (Previously Added) The method of Claim 291, wherein the instance I_1 uses first information for locating the first mobile station, wherein the first information is dependent upon signal timing measurements from the wireless signals S.

293. (Previously Added) The method of Claim 91, wherein the instance I_1 uses first information from the wireless signals S, wherein the first information is dependent upon a wireless coverage area of the at least one communication station.

294. (Previously Added) The method of Claim 99, further including a step of providing display information for displaying a representation of a location estimate L of the first mobile station, wherein said display information is for displaying a map of an area having the location estimate L, and for concurrently displaying information indicating an accuracy of the location estimate L.

295. (Previously Added) The method of Claim 294, wherein said display information is displayed at a mobile station M that has requested a location of the first mobile station.

296. (Previously Added) The method of Claim 118, wherein said outputting step includes providing accuracy information indicating an accuracy of said resulting location information, wherein said accuracy information is displayed with said at least one location of the mobile station.

297. (Previously Added) The method of Claim 118, wherein for at least one location of the mobile station said step of determining uses both said first and second values.

298. (Previously Added) The method of Claim 118, wherein said first location technique includes a step of using wireless signals, S, between the first mobile station and at least one terrestrial transceiver to improve upon of said first location information over a performance of said first location technique without using the wireless signals between the first mobile station and the at least one terrestrial transceiver.

130 ~~299~~. (Previously Added) The method of Claim ~~298~~ 129, wherein said first location technique includes a step of using information dependent upon a wireless coverage area of the at least one transceiver for improving said first location information.

131 ~~300~~. (Previously Added) The method of Claim ~~299~~ 130, wherein the at least one transceiver includes a base station for providing two way communication with the mobile station.

Please amend claim 301 as follows:

120 132 ~~301~~. (Currently Amended) The method of Claim ~~117~~ 26, wherein said step of second receiving includes receiving said second location related information from an activation of said signal processing technique, and the terrestrial transceivers are stationary.

Please amend claim 302 as follows:

133 ~~302~~. (Currently Amended) The method of Claim ~~117~~ 26 [301], wherein said first mobile station [at least one mobile station and] is an instance of said M_b [are both the first mobile station], and the terrestrial transceivers are stationary.

Please amend claim 303 as follows:

134 ~~303~~. (Currently Amended) The method of Claim ~~302~~ 133, wherein said steps of first supplying and first receiving are for a first location of the first mobile station, and said steps of second supplying and second receiving provide [are] for a second location of the first mobile station, and said first and second locations are one of: (i) substantially a same location, and (ii) substantially a different location.

Please amend claim 304 as follows:

135 ~~304~~. (Currently Amended) The method of Claim ~~117~~ 26 [303], wherein said resulting location information for said first mobile station includes a timestamp indicative of when said resulting location information is applicable to a location of said first mobile station, and said first mobile station provides an instance of M_b [includes one or more estimates for said first and second locations].

Please amend claim 305 as follows:

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136 305. (Currently Amended) The method of Claim 304 further including a step of presenting said resulting location information for said first mobile station on one or more graphical displays, wherein a map is concurrently displayed in at least one of said displays[; and

wherein when the first and second locations are substantially different, at least one of: a first of said estimates for the first location, and a second of said estimates for the second location is represented on one of the displays without a representation of the other of said first and second estimates being represented on the one display].

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Please amend claim 306 as follows:

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137 306. (Currently Amended) The method of Claim 117 [305, wherein said] further including a step of presenting said resulting location information for one or both of said first and second mobile stations on a visual display, wherein said display presents [includes representing said] information related to a corresponding accuracy of said resulting location information for the one or both of said first and second mobile stations [as one or more geographical areas on at least one of the displays].

Please amend claim 307 as follows:

137

138 307. (Currently Amended) The method of Claim 306, wherein said step of presenting includes displaying a representation of a first [of said] geographical area[s] for the first location, and a representation of a second [of said] geographical area[s] for the second location.

Please amend claim 308 as follows:

26

139 308. (Currently Amended) The method of Claim 117 [301], wherein one of:

(a) the first mobile station is included in a mobile base station; and

(b) M_c [the at least one mobile station] is included in a mobile base station.

Please amend claim 309 as follows:

140 309. (Currently Amended) The method of Claim ~~117~~ 26 [303], wherein for at least one location of the first mobile station wherein both said first and second location related information provide location information for the first mobile station, said second location related information for the first mobile station is given preference over said first location related information for the first mobile station [when said first and second locations are the substantially same location].

Please amend claim 310 as follows:

141 310. (Currently Amended) The method of Claim ~~117~~ 26 [308], wherein said determining step includes modifying a location estimate of the first mobile station obtained using at least one of said first and second values so that a more likely location estimate is obtained, said more likely location obtained as a function of a position of a known geographical feature that is sufficiently close to the first location estimate so that the closeness is used to determine said more likely location estimate.

142 311. (Previously Added) The method of Claim ~~117~~ 26, wherein when each of the first and second location related information include an estimate for substantially a same location of the first mobile station, each of said estimates is substantially unaffected by the corresponding data input to the location technique providing the other of the estimates.

Please amend claim 312 as follows:

143 312. (Currently Amended) The method of Claim ~~119~~ 28, wherein:

(a) said first [second] location estimator performs said signal processing technique for obtaining said first [second] information for M_1 wherein I_5 is M_1; and

(b) said first [second] information is selected over said second [at least one other location related] information received from [a] said second mobile station location estimator [different from the second location estimator], wherein said first [second] information receives preference in determining said resulting location unless there is information indicating a likelihood of said first [second] information providing reduced performance in locating said [one] mobile station M_1.

Please amend claim 313 as follows:

144 28

313. (Currently Amended) The method of Claim 119, wherein: said first [second] location estimator performs said signal processing technique when determining said first information, and also performs said locus computing technique for obtaining said first [second] information.

145 28

314. (Previously Added) The method of Claim 119, further including a step of providing display information for: (a) displaying a representation of said resulting location estimate, wherein said display information is for displaying with a map of an area having the resulting location estimate, and (b) concurrently displaying information indicative of an accuracy of the resulting location estimate.

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315. (Previously Added) The method of Claim 121, wherein said determining step includes determining at least one of said resulting location estimates as a function of a position of a known geographical feature that is sufficiently close to one of the first or second location estimates so that the closeness is used to determine said more likely location estimate.

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316. (Previously Added) The method of Claim 121, wherein TS is one of: a mobile base station, and a fixed location base station.

148 35

317. (Previously Added) The method of Claim 126, wherein activation information is provided to the first and second location techniques via a predetermined common data distribution component, wherein said component distributes mobile station location data specific to each of the first and second location techniques according to a content of said data expected by the location technique.

149 35

318. (Previously Added) The method of Claim 126, further including a step of determining said resulting location information according to output criteria corresponding to the source.

Please amend Claim 319 as follows:

150 149

319. (Currently Amended) The method of Claim 318, further including a step of requesting said location data for one of: performing a routing function for routing the mobile station, responding to a user

of said mobile station request for location, locating a child, locating a stolen vehicle, and keeping entities apart.

Please amend Claim 320 as follows:

151 35

320. (Currently Amended) The method of Claim 126, wherein said resulting location information includes one or more of:

(a) a value indicative of a likelihood of the mobile station being at a location estimate represented by the resulting location information;

(b) an identifier for identifying the mobile station;

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(c) [an identification of one or more cells of a geographical partition, wherein the cells include a location estimate of the resulting location information] data identifying one or more geographical extents, wherein each of the geographical extents has associated therewith a location estimate (L) of the mobile station such that the location estimate L, wherein the one or more geographical extents provide additional information related to their associated location estimate L;

(d) a timestamp indicative of when the resulting location information corresponds to a location of the mobile station; and

(e) at least one of: a speed of the mobile station, a direction of the mobile station, a change in speed of the mobile station, and a change in direction of the mobile station.

152 35

321. (Previously Added) The method of Claim 126, wherein said first location technique uses wireless signals, S, between the mobile station and a terrestrial wireless transceiver to improve at least one performance characteristic of said first location technique over a performance of said first location technique without use of the wireless signals S..

Please amend Claim 322 as follows:

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322. (Currently Amended) The method of Claim 126, further including providing mapping data of an area having a location estimate (L) of said mobile station wherein L is included in said resulting location information, and providing for concurrent display, with said mapping data, information indicating an accuracy of the location estimate L.

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323. (Previously Added) The method of Claim 121, further including a step of determining, using said resulting location information, output location information according to output criteria corresponding to an application requesting data related to a location of the mobile station.

155 154
324. (Previously Added) The method of Claim 323, wherein said output criteria includes at least some of:

(a) a transmission protocol;

(b) a granularity of by which a location estimate of the mobile station represented by said resulting location information is to be provided;

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(c) a frequency with which repeated location estimates of the mobile station are to be output to the application;

(d) destination data for determining where said resulting location information is to be transmitted;

(e) an indication as to whether a location estimate of the mobile station is to be adjusted according to a known geographical feature different from the communication stations; and

(f) a desired representation of a location estimate of the mobile station represented by said resulting location information.

156 43
325. (Previously Added) The method of Claim 134, wherein said first obtaining step includes receiving said location information determined by said third technique as a portion of said first mobile station related location information.

Please amend Claim 326 as follows:

159 156
326. (Currently Amended) The method of Claim 325, wherein said additional data includes one of:

(a) data from a transmission from a [location] base station, of said collection <u>of one or more of the plurality of terrestrial communication stations</u>, detected by the first mobile station, <u>said base station having a substantially reduced wireless coverage area in comparison to at least one of the terrestrial communication stations</u>;

(b) a location estimate for the first mobile station determined by a site remote from the first mobile station and transmitted to the first mobile station via a base station of the commercial mobile radio service provider, wherein the site is used for determining location information for a plurality of the mobile stations;

(c) data indicative of multipath signals received from a wireless transmission of a communication station of said collection; and

(d) data indicative of wireless timing measurements for wireless signals received at the first mobile station from one of the communication stations of said collection.

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327. (Previously Added) The method of Claim 325, wherein said third technique further includes a transmission from the first mobile station to a communication station of said collection for requesting said additional data.

Please amend Claim 328 as follows:

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328. (Currently Amended) The method of Claim 134, wherein when a third [second] mobile station replaces the first mobile station in said steps of receiving, generating, first obtaining and determining, a same site performs at least one of said steps for locating each of the first and third [second] mobile stations, and wherein for locating the third [second] mobile station, said one or more location estimators perform a different collection of one or more of said first, second, third, and fourth techniques from those used for locating the first mobile station.

160 45
329. (Previously Added) The method of Claim 137, wherein for the substantially same location, said first value has an associated first preference and said second value has an associated second preference, and said first and second preferences are used in determining said resulting location estimate.

Please amend Claim 330 as follows:

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330. (Currently Amended) The method of Claim 140, wherein [said corresponding] a performance of said obtaining step, using said first location, includes said step of improving upon said [first] instance of at least said first location estimate so that [said first corresponding instance of] said resulting location information is expected to be more accurate than said first location estimate [instance].

Please amend Claim 331 as follows:

162 47
331. (Currently Amended) The method of Claim 140, wherein [said corresponding] a performance of said obtaining step includes said step of providing information indicative of an accuracy of said first corresponding instance.

Please amend Claim 332 as follows:

163 ~~332.~~ (Currently Amended) The method of Claim ~~142~~ 49, wherein [said corresponding] a performance of said obtaining step includes performing said step of improving upon said [first] instance of at least said first location estimate so that said first corresponding instance of said resulting location information is expected to be more accurate than said first location instance.

Please amend Claim 33 as follows:

164 ~~333.~~ (Currently Amended) The method of Claim ~~142~~ 49, wherein [said corresponding] a performance of said obtaining step includes performing said step of providing information indicative of an accuracy of said first corresponding instance of said resulting location information.

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165 ~~334.~~ (Previously Added) The method of Claim ~~142~~ 49, wherein said first location estimator is dependent upon a result from at least two of said location technique categories, wherein one of said at least two location categories is one of said location techniques (a) and (e).

Please amend claim 335 as follows:

166 ~~335.~~ (Currently Amended) The system of Claim ~~169~~ 60, wherein said mobile station location system includes at least one of: said [resulting estimator] selector and said combiner.

167 ~~336.~~ (Previously Added) The system of Claim ~~335~~ 166, wherein said resulting estimator includes said selector.

Please amend claim 337 as follows:

168 ~~337.~~ (Currently Amended) The system of Claim ~~336~~ 167, wherein said second data includes a corresponding location estimate (E_2) for M_0, and said selector uses one of: (i) a predetermined preference

of one of said corresponding location estimates E_1 and E_2 over another of said corresponding location estimates E_1 and E_2, (ii) a preference of one of said corresponding location estimates E_1 and E_2 over another of said corresponding location estimates E_1 and E_2 determined according to a past mobile station locating performance for each of the first and second location estimating sources, (iii) a preference according to signaling or environmental characteristics of a geographical area, and (iv) a preference according to a consistency of one of said corresponding location estimates with another of said corresponding location estimates.

Please amend claim 338 as follows:

169 60 120

~~338~~. (Currently Amended) The system of Claim ~~169~~, further including an output gateway for transmitting location information, indicative of said likely location estimate [estimator] to a predetermined destination, on one or more communication networks, wherein said location information is determined using a criteria indicative of an expected input by the destination.

Please amend claim 339 as follows:

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~~339~~. (Currently Amended) The system of Claim ~~338~~, wherein said location information includes data indicative of a time when said location information is indicative of a location the mobile station M_0.

171 166

~~340~~. (Previously Added) The system of Claim ~~335~~, wherein said resulting estimator includes said combiner.

Please amend claim 341 as follows:

172 171

~~341~~. (Currently Amended) The system of Claim ~~340~~, wherein said second data includes a corresponding location estimate (E_2) for M_0, and said combiner includes a most likely mobile station location estimator that determines a most likely estimate of the mobile station M_0 as function of one of: (i) an expected likeliness of the mobile station M_0 being in at least one of E_1 and E_2 [two or more of said corresponding estimates], (ii) an output indicative of a consistency between archived wireless signal measurements and wireless signal measurements for determining at least one of E_1 and E_2 [locating the mobile station M for at least one of two or more of said corresponding estimates], (iii) an output indicative of a consistency between a geographic feature of an area overlapping with at least one of E_1 and E_2, and a characteristic of a movement of M_0 [two or more of said corresponding estimates], and (iv)

an output indicative of a consistency between a [previous] collection of one or more location estimates of the mobile station M_0 for one or more previous locations of M_0 [tracking M], and at least one of E_1 and E_2 [two or more of said corresponding estimates].

Please amend Claim 342 as follow:

342. (Currently Amended) The method as claimed in Claim 159, further including a step of determining, using said location estimate, output location information by accessing [according to] output criteria corresponding to a request for [an application requesting] data related to a location of the mobile station M.

Please amend Claim 343 as follows:

343. (Currently Amended) The method of Claim 342, wherein said output criteria includes at least some of:

(a) a transmission protocol;

(b) a granularity of by which a location estimate of the mobile station represented by said output location information is to be provided;

(c) a frequency with which repeated location estimates of the mobile station are to be output to a destination corresponding to the request [the application];

(d) destination data for determining where said output location information is to be transmitted; and

(e) an indication as to whether a location estimate of the mobile station is to be adjusted according to a known geographical feature different from the communication stations.

344. (Previously Added) The method of Claim 159, further including a second step of generating a second location estimate for an unknown location of one of the additional mobile stations, wherein said second location estimate is dependent upon a different collection of one or more instances of said first, second and third techniques.

345. (Previously Added) The method of Claim 159, wherein said location estimate has associated therewith a timestamp.

177 346. (Previously Added) The method of Claim 159, further including a step of outputting output location information for display, wherein a location accuracy of said output location information is represented as one or more geographical areas on a map.

178 347. (Previously Added) The method of Claim 159, wherein said step of generating includes giving preference to the geographical extent from said instance of one of said first, second and third techniques over the geographical extent from said instance of a different one of said first, second and third techniques.

179 348. (Previously Added) The method of Claim 159, wherein said step of generating includes preferring a common area of said geographical extents from said instances of said at least two of said first, second and third techniques.

Please amend Claim 349 as follows:

180 349. (Currently Amended) The method of Claim 163, wherein said combiner is activated by said resulting estimator, and said combiner determines said likely location estimate by identifying an area common to two of said location estimates as being more likely to be in said likely location estimate.

Please amend Claim 350 as follows:

181 350. (Currently Amended) A method for locating mobile stations, comprising:

providing access to each of a plurality of mobile station location determining resources for determining corresponding instances of location information for locating mobile stations using corresponding data obtained from measurements of wireless signals transmitted between:

(i) the mobile stations, and

(ii) one or more of: (1) one or more of a plurality of communication stations capable of at least wirelessly detecting the mobile stations, and (2) one or more non-terrestrial wireless signal transmitting stations;

for each mobile station M of some of said mobile stations, perform steps (A) through (F) following:

(A) first providing data to a first of said resources for obtaining a first instance of said corresponding location information for the mobile station M at a location L_1, wherein in determining said first instance, said first resource uses a result from a first location technique included in at least one of the

location determining categories ([c]b1) through ([c]b5) following [below] said step of second providing below;

(B) second providing data to a second of said resources for obtaining a second instance of said corresponding location information for the mobile station M at a location L_2, wherein said second resource uses a result from a second location technique included in at least one of the location determining categories ([c]b1) through ([c]b5) that does not include said first location technique[, and wherein for at least one occurrence of locating one of the mobile stations, said first and second instances include different geographical extents for locating the one mobile station]:

(b1) a first category of [pattern recognition] location determining techniques, wherein each said [pattern recognition] technique (T_1) of said first category determines a geographical extent G_a for a location of a mobile station (M_a) by identifying a pattern of [multipath] signal characteristics for wireless signals communicated between M_a and the communication stations as likely to have been a result of M_a being in G_a, wherein said T_1 performs said identifying by determining a similarity between: (b1-1) one or more of said signal characteristics that are indicative of a non-line of sight communication with M_a, and (b1-2) data obtained from a survey of wireless signal characteristics in an area including said geographical extent G_a [said multipath signal characteristics are indicative of non-line of sight communications];

(b2) a second category of [trainable] location determining techniques, wherein each said [trainable] technique of said second category determines a geographical extent G_b for a location of a mobile station (M_b) as a result of (I) and (II) following[said trainable technique]:

(I) generating an association for associating: (i) each location L of a plurality of geographical locations with (ii) data indicative of corresponding measurements of wireless signals transmitted between some one of said mobile stations and the communication stations, wherein said some mobile station is approximately at the location L, and

(II) using said association together with characteristics of signals communicated between M_b and the communication stations for determining the geographical extent G_b for the location of M_b;

(b3) a third category of offset determining techniques, wherein each said offset determining technique determines a geographical extent G_c for a location of a mobile station (M_c);

wherein said offset determining technique is capable of utilizing one or more timing measurements of wireless signals between the mobile station M_c and a plurality of the communication stations for determining the geographical extent G_c;

wherein said timing measurements are a function of a signal time delay between the mobile station M_c and at least one communication station CS of the plurality of communication stations, and said timing measurements are for determining G_c as function of at least: a location of CS, and a predetermined formula representative of a geometric curve for determining a horizontal position of M_c;

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wherein there is a corresponding portion of the signal timing measurements that are obtained during a plurality of wireless signal transmissions between the mobile station M_c and CS, with at least one of the transmissions being from the mobile station M_c to CS;

wherein said communication station CS is attached to the ground; and

wherein each of said offset determining techniques determines a geographical extent for a location of each of a plurality of different mobile stations;

(b4) a fourth category of direction [angle] of arrival location determining techniques wherein each said direction [angle] of arrival technique determines a geographical extent for a location of a mobile station (M_d) by determining a direction from which wireless signals arrive at at least one of the communication stations from the mobile station M_d;

(b5) a fifth category of [signal processing] wireless location techniques wherein each said [signal processing] technique (T_5) of said fifth category determines a geographical extent for a location of a mobile station (M_e) using wireless signals received at the mobile station M_e from the non-terrestrial transmitting stations, wherein said wireless signals provide time values, and said [signal processing] technique T_5 determines at least one elapsed time for

signal transmissions to M_e [differential between the time values] for the wireless signals transmitted by one or more [two] of the non-terrestrial transmitting stations;

(C) first obtaining first structured location data using said first instance;

(D) second obtaining second structured location data using said second instance, wherein said second location technique is included in said fifth category;

wherein each of said first and second structured location data includes a common data representation for a plurality of location attributes, including (d1) through (d2) following:

(d1) an attribute A_1 for representing a geographical extent within which a mobile station being located is expected to be;

(d2) an attribute related to one of: an error in data for A_1, and a likelihood of the mobile station being located being in the geographical extent represented by A_1;

(E) generating [subsequent] resulting location information of a location L_M of the mobile station M, said subsequent location information being dependent upon said attributes (d1) and (d2) for at least one [each] of said first and second structured location data; and

(F) outputting said subsequent location information to a predetermined destination on a communications network.

351. (Previously Added) The method of Claim 350, wherein said plurality of location attributes further includes an attribute for a timestamp.

Please amend Claim 352 as follows:

352. (Currently Amended) The method of Claim 350, wherein said plurality of location attributes further includes an attribute for descriptor information indicative of a reason that another one of said plurality of location attributes has its corresponding value [related to location processing performed by one of said resources in obtaining an instance of said location information for M].

353. (Previously Added) The method of Claim 350, wherein said plurality of location attributes includes the attribute related to an error in data for A_1.

354. (Previously Added) The method of Claim 350, wherein said plurality of location attributes includes the attribute related a likelihood of the mobile station being located being in the geographical extent represented by A_1.

Please amend Claim 355 as follows:

355. (Currently Amended) The method of Claim 350, wherein said step of providing and at least one of said steps (A) through (F) are performed at one of: a mobile base station, and a stationary site.

356. (Previously Added) The method of Claim 350, wherein said first location technique is performed at a site remote from the mobile station M.

Please amend Claim 357 as follows:

Please amend Claim 357 as follows:

357. (Currently Amended) The method of Claim 350 [348], further including performing said outputting step according to a frequency of output desired by the destination.

Please amend Claim 358 as follows:

358. (Currently Amended) The method of Claim 348, further including a step of outputting said resulting location to the destination on the communications network for one of the following uses: surveilling a parolee, locating an animal, locating a person related to a person initiating the request, providing a caller with his/her location, routing a vehicle, and used for keeping at least two entities apart.

Please amend Claim 359 as follows:

359. (Previously Added) The method of Claim 348, further including a step of receiving a request for locating the mobile station M, wherein said request is related to one of: a location of a vehicle via the Internet, and a location of a 911 caller.

Please add Claim 360 as follows:

360. (New) The method of Claim 350, wherein said step of first providing includes a step of requesting activation of said first resource via a communication on one of: the Internet and a telephony network.

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361. (New) The method of Claim 85, wherein said the signal location technique (d) further includes a step of selecting one or more of the geographical location representations of (d2)(i) that are likely to be approximate to the unknown location of the mobile station M.

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362. (New) The method of Claim 117, wherein said first and second mobile stations are in two way communication with a commercial mobile radio service provider via at least one of said plurality of transceivers included in a base station of the commercial mobile radio service provider.

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363. (New) The apparatus of Claim 163, wherein E_1 is provided by the first estimating source, ES1, and said second data includes a corresponding geographic extent for M_0 obtained from the second estimating source, ES2.

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364. (New) The apparatus of Claim 163, wherein at least one of: said likely location estimate is an estimate of M_0 at substantially L_0, and said second data includes a geographic extent for M_0 substantially at the location L_0.

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365. (New) The apparatus of Claim 163, wherein said first data includes one or more first data values that provide information descriptive of location processing for locating M_0, and second data includes one or more second data values that provide information descriptive of location processing for locating M_0;

wherein the at least some of said first data values and the at least some of said second data values have a common predetermined semantics for their interpretation.

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366. (New) The apparatus of Claim 163, wherein for ES1and ES2, their corresponding plurality of mobile stations are substantially identical.

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367. (New) The apparatus of Claim 163, wherein each of said ES1 and ES2 substantially resides with one of: (1) one of said plurality of mobile stations, and (2) at a geographically stationary location.

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368. (New) The apparatus of Claim 367, wherein one or more of: (a) ES1 substantially resides with a mobile base station, (b) ES2 substantially resides with a mobile base station, (c) one of ES1 and ES2 substantially resides at a location center, and (d) one of ES1 and ES2 are accessible via the Internet.

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369. (New) The apparatus of Claim 169 wherein said first data includes one or more first data values that provide information descriptive of location processing for locating M_0, and second data includes one or more second data values that provide information descriptive of location processing for locating M_0;

wherein the at least some of said first data values and the at least some of said second data values have a common predetermined semantics for their interpretation.

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370. (New) The location system of Claim 106, wherein said mobile station M is different from at least one of the one or more mobile stations used for obtaining said wireless signal data of (a2).

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371. (New) The method of Claim 117 further including providing said resulting location information, for each of the first and second mobile stations, for presentation, wherein said presentation for at least one of said first and second mobile stations is determined according to an expected accuracy of said resulting location information.

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372. (New) The method of Claim 371, wherein for at least one of said first and second mobile stations, said presentation provides indications of changes in location accuracy with successive instances of said resulting location information.

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373. (New) The method of Claim 121, further including receiving instances of said first and second information at a common predetermined interface.

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374. (New) The method of Claim 121, further including at least some of the following steps:

(i) activating at least one common predetermined mobile station location related component for determining said resulting location estimates for both said steps of obtaining (c) and (d);

(ii) outputting said resulting location estimates for said steps of obtaining (c) and (d) via a common predetermined network interface;

(iii) providing information for activating the first and second location techniques, wherein said information for activating is output by a common activation component; and

(iv) said step of determining includes, for instances of each of said first and second information, accessing a plurality of common data representations of location attributes, including (1) and (2) following:

(1) an attribute A_1 for representing a geographical extent within which the mobile station being located is expected to be; and

(2) an attribute related to one or more of: an error in geographical extent, an accuracy in said geographical extent, and a likelihood of the mobile station being located in said geographical extent represented by A_1.

206 375. (New) The method of Claim 121, wherein said step of receiving includes receiving descriptor information providing information related to the processing performed for determining an instance of one or more of said first and second information.

207 376. (New) The method of Claim 85, wherein when said signal location technique (d) is used to locate M, said signal location technique uses one or more measurements for the multipath characteristics of wireless signals of (d1) in determining the likely geographical range or location L, and said measurements for the multipath characteristics are indicative of at least non-line of sight transmission between the mobile station M and the communication stations.

208 377. (New) The method of Claim 142, wherein said second estimator is dependent upon a result from the second location technique included in a different one of the following (a) through (e) location technique categories from the first set.

209 378. (New) The method of Claim 142, wherein said second estimator uses at least one of the location techniques (a) through (e) to obtain, for the at least some instance of locating one of the mobile stations (M_j), :a location estimate that is effectively different from a corresponding location estimate of M_j by said first location estimator.

210 379. (New) The method of Claim 99, wherein said second location information is not dependent upon any geographical information for locating the second mobile station from said at least one technique.

211 380. (New) The method of Claim 350, wherein for at least one occurrence of locating one of the mobile stations, said first and second instances include different geographical extents for locating the one mobile station.

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212 381. (New) The method of Claim 350, wherein said location L_1 and said location L_2 are substantially identical.

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213 382. (New) The method of Claim 350, wherein said location L_1 and said location L_2 are effectively different locations of the mobile station M.

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383. (New) The method of Claim 350, wherein said mobile station M is being tracked and said location L_1 and said location L_2 are for effectively different times during the tracking of M.

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384. (New) The method of Claim 350, wherein said location L_M is effectively one of said location L_1, and said location L_2.

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385. (New) The method of Claim 384, wherein said location L_M is effectively identical to each of said location L_1 and said location L_2.

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386. (New) The method of Claim 350, wherein said location L_M is a location of the mobile station M for a time subsequent to a time for the mobile station M being at one or more of said location L_1 and said location L_2.

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387. (New) The method of Claim 350, wherein said location L_M is a location of the mobile station M for a time subsequent to a time for the mobile station M being at each of said location L_1 and said location L_2, wherein said location L_1 and said location L_2 are substantially different.

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388. (New) The method of Claim 101, wherein at least one of said additional location estimates is effectively identical to (a2)(ii) in one of said data collections from which one of said geographical representation of (a1) is included in said group of said geographical location representations of (a1).

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389. (New) The method of Claim 101, wherein said deriving step determines said further location estimate as an offset from said initial location estimate.

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390. (New) The method of Claim 101, wherein for said representations of (a2), said corresponding representations of the geographical locations of (a1) have been determined to be operably accurate geographic locations.

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391. (New) The method of Claim 101, further including a step of determining whether said condition indicative of a closeness is satisfied, wherein said determining step includes one of: (i) determining whether a location estimate from the first mobile station location estimator is within a predetermined area containing the initial location estimate, and (ii) determining whether a location estimate from the first mobile station location estimator is within predetermined distance of the initial location estimate.

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392. (New) The method of Claim 101, further including a step of determining whether said condition indicative of a closeness is satisfied, wherein said determining step is dependent upon one or more of:

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(a) a number of the additional location estimates that are determined to be sufficiently close to said initial location estimate so that said group includes one or more geographical location representations closer to the location of the mobile station M than said initial location estimate; and

(b) a representation of an area (A) of a predetermined wireless coverage area of the plurality of fixed location communication stations, said area A including said initial location estimate, said area A used to determine said additional location estimates so that said group includes one or more geographical location representations closer to the location of the mobile station M than said initial location estimate.

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393. (New) The method of Claim 392, wherein the area A includes said additional location estimates.

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394. (New) The method of Claim 101, wherein said obtaining step includes determining at least a first of said additional location estimates data prior to determining a second of said addition location estimates, wherein said first additional location estimate satisfies a first condition of a closeness to said initial location estimate, said second additional location estimate satisfies a second condition of a closeness to said initial location estimate, and said second additional location estimate does not satisfy said first condition.

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395. (New) The method of Claim 101, wherein said deriving step includes determining a likelihood of the further location estimate including the location of the mobile station M.

L20 cond'd 227 226

396. (New) The method of Claim 395, wherein said determining step includes determining data indicative of a density of a set (S) of one or more geographic locations within an area of said further location estimate, wherein for each member of S, there is one of the data collections whose (a1) portion is effectively identical thereto, and whose (a2)(ii) portion is effectively identical to one of said additional location estimates.